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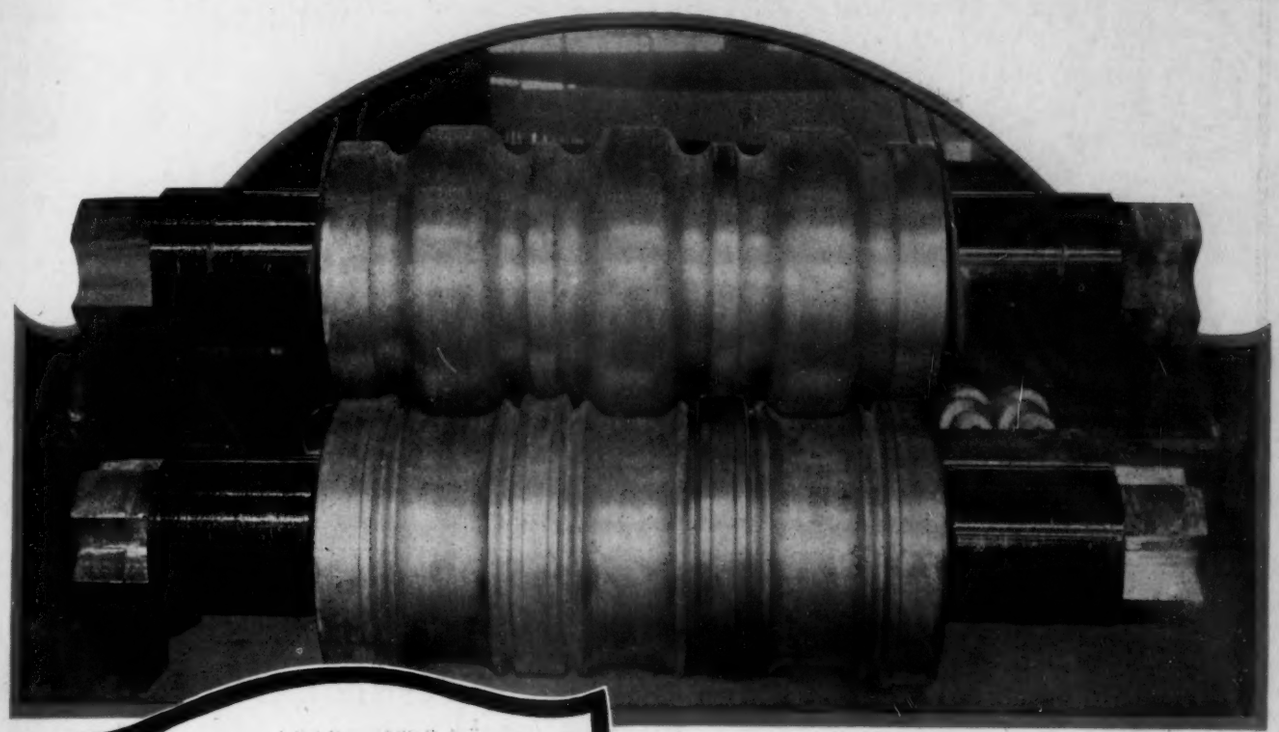

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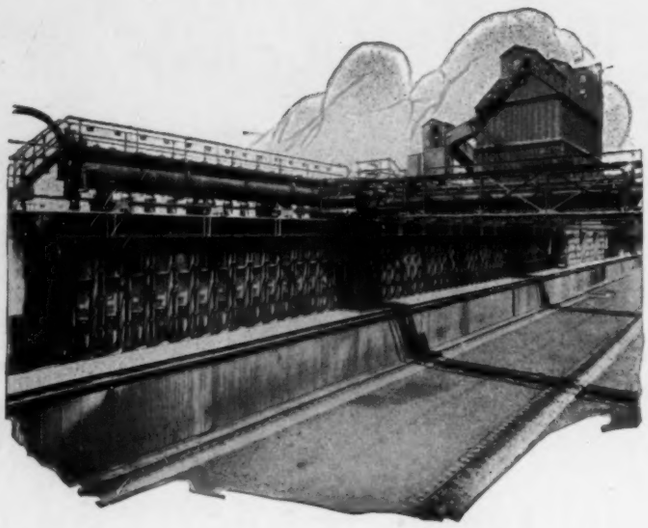

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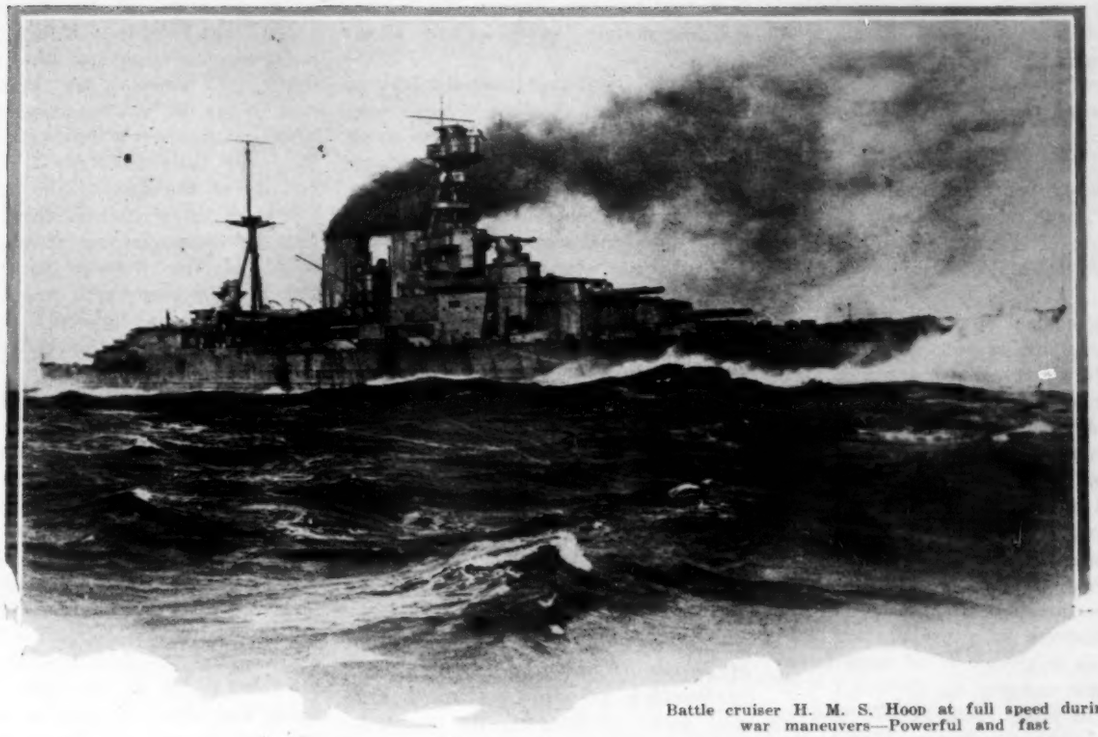

Battle cruiser H. M. S. Hood at full speed during war maneuvers—Powerful and fast

Success in Foreign Trade Rests on Definite Naval Policy

By Capt. A. W. Hinds, U. S. N.

I HAVE heard it said that a book written by an American naval officer was the cause of the World war. The title of the book is *The Influence of Sea-Power on History*, and its author was the late Rear Admiral A. T. Mahan, U. S. N.

The story runs that the German Kaiser read the book and was so impressed with Mahan's analysis of the effect of naval strength on national welfare that he had all officials, army, navy and civil read it. The book deals mainly with the history of England, France, Holland and Spain and shows in a clear, simple manner how closely allied national prosperity and sea-power were in the cases of these great powers. It shows conclusively how England built up in wealth and influence as her navy increased in comparative strength and how the influence of Spain, Holland and France declined as their power at sea weakened. It was mainly the influence of Mahan's books that brought about the decision of the Germans to build a strong navy—a decision the British could not accept.

History shows national prosperity and naval strength go hand-in-hand.

The United States has relinquished its leadership on the sea.

Does this mean America is willing to forego its hope for important foreign trade and what it means to industry?

There exists all over the world a pressure for reduction in naval armament. Among the other leading naval powers, the British Empire, Japan, France and Italy, the pressure is due to national poverty. In the United States the pressure is due partly to a wave of economy and partly to a national spirit of generosity. The United States is not a warlike nation and those of her citizens, who are pressing for general naval disarmament, undoubtedly feel that America will be safe even with her naval strength reduced to a very low limit. It is not believed for an instant that any American would work for disarmament if he thought he was thereby placing his country in a dangerous position.

The author, Captain Hinds, is chief of staff, battleship divisions of the United States fleet.

As is generally known, the United States has taken part to date in two naval reduction conferences. The first was at Washington in 1922, when we engaged to scrap twice as much modern war-craft as the British Empire, and voluntarily gave up our position as the world's leading naval power to drop back to a position of equality with the British in battleships and air-craft carriers.

No agreement was reached as to submarines or cruisers or auxiliary war-craft at the Washington conference. Since that conference the British and Japanese have continued building submarines and cruisers until these three leading naval powers are nearly equal in submarine strength, and the ratio in cruiser strength is about as follows: British Empire 4, Japan 2, United States 1.

At the present time America has representatives in a preparatory conference on disarmament of some twenty nations meeting at Geneva. This body is to study disarmament and to try to decide whether a World disarmament conference promises any practical results. With the league of nations showing signs of breaking up the chances of a successful World disarmament conference in the near future seem poor, but it seems probable that, in case of failure of the general disarmament negotiations at Geneva, a purely naval disarmament conference will soon be proposed by one of the principal naval powers.

We Need a Farsighted Policy

One of the criticisms of American statesmanship in the past has been that it has not been sufficiently farsighted, and that those who have been responsible for steering the ship of state have not fully appreciated how closely naval strategy and national policy are tied together. The country has never really had any stable naval policy.

Not only has America never had any naval policy, but the country has been so busy in its own development that it has been difficult to lay down any kind of a policy. Policy is born of the interests of the people, and our people have been so busy with their own affairs that they have taken little reasoned cognizance of international matters.

Before we go too far, however, in laying down a permanent policy as to the comparative size of the American navy, there are several questions that must be carefully considered before any sound naval policy for the United States can be formed.

First: Has human nature so changed that nations no longer lay down policies mainly beneficial to themselves?

Second: Is it true that the leading nations have always been those strong on the sea? If so, just how much world leadership is the United States willing to take? And bearing on the two preceding questions can America avoid accepting world leadership?

Third: Do we need trade outside the United States and what influence has sea power on foreign trade?

Fourth: How serious is the United States with respect to the open door policy?

Fifth: What is America going to do about the Philippine Islands?

Why We Need a Navy

DO WE realize how definitely a loss in naval power, as compared, of course, with the naval strength of other powers, means restriction of the national will and purpose insofar as all relations with foreign nations and distant dependencies are concerned? Captain Hinds, in a letter to the editor, made clear his purpose. He said in part: "It seems very difficult to get the American people to learn about their navy. If we can once get the people to know what the navy is for, and what it can do, then our responsibility ends. After that, it is only a question of our duty to keep what ships the nation gives us in efficient fighting condition."

The size of the American navy depends on the answers to the questions given above, and common sense dictates that they be answered before the national mind is made up as to how much of a cut shall be recommended in the next naval disarmament conference.

It is unfortunate but true that few Americans know much about their navy. I will point this out by a simple illustration from naval tactics. In a normal naval battle destroyers are used to fire torpedoes at the head of the main battle line of the enemy. The destroyers do not come up from astern and fire at the capital ships, because with the capital ship making 21 knots and the torpedo only about 28 knots, it would take a long time for the torpedo to catch up with the the heavy ship. The torpedoes make a white streak in the water so, if they are gaining very slowly on the battleship, there is time for the latter to move off to one side and dodge the torpedo. If the torpedo is fired from ahead, however, the ship and torpedo are approaching each other at about sixty miles an hour, or a mile a minute, so there would be little time for the ship to get out of the way of the torpedo.

Modern naval tactics, then, provide for the destroyers to attack on the bow and the defense against this attack is to keep light cruisers ahead of the battle line to shoot the flimsy destroyers out of the water before they can fire their torpedoes. To answer this light cruisers are sent along with the attacking destroyers to take care of the enemy light cruisers while the destroyers are attacking.

Take now the case of the British, for example. We are at war and are trying to make a destroyer attack on their battle line. We send in our destroyers, supported by light cruisers, but the British light cruisers are out there on the bow of their battle line—four of them to our one—and we cannot get home with our attack—the numerical odds are too much against us.

Now reverse the situation—British destroyers supported by their light cruisers—four to our one—come down on our bows to attack. We must assume that *four* British cruisers can knock out *one* of ours—so the British destroyers *could* get home their attack. In other words, the British could use their destroyers successfully against us where we could not use ours against them with any measure of success. At present they have us at a tremendous tactical disadvantage; naturally they will keep us at that disadvantage as long as possible. As regards light cruisers, the Japanese also have us in a tactical inferiority, though their cruiser strength is only two to our one, as compared to the British ratio of four to one.

Number of Cruisers Not Limited

The matter of comparative cruiser strength was taken up in the Washington conference in 1922. The size of the cruisers was limited to 10,000 tons and the size of guns to 8-inch, but the conference made no headway as to limiting the number of cruisers each nation should have.

No blame can be attached to the naval disarmament conference in Washington for the position of inferiority of the United States with respect to light cruisers or torpedo attacks by destroyers. The responsibility here is on congress which

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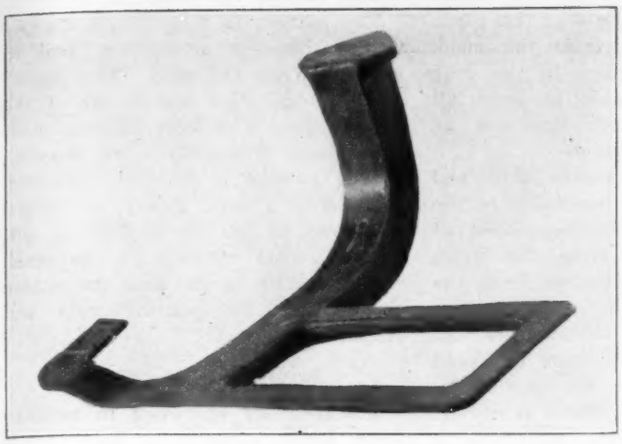

Fig. 1

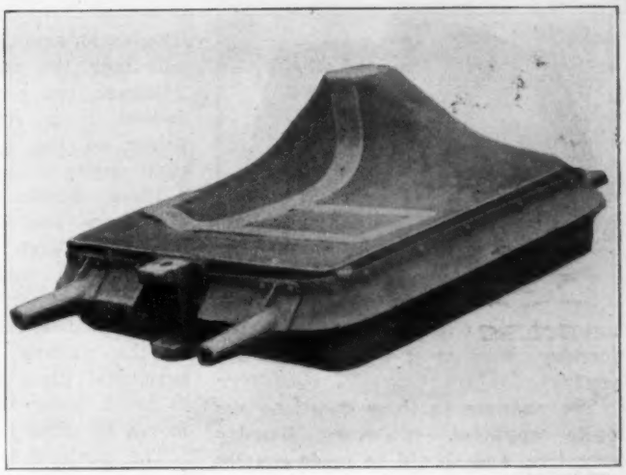

Fig. 2

Buyer Should Provide Steel Foundry With Good Pattern Equipment

By K. V. Wheeler

IN MANY foundries in the past, and unfortunately, in some foundries at present, decisions governing the practices to apply to the manufacture of specific castings have been based frequently on tradition and guesswork instead of scientific study. Progressive steel foundries, have emerged from the stage characterized to undesirable extent by precedent and speculation; and by the application of definite knowledge, have been able to approach their problems with a greater assurance than they previously felt, that desired results will materialize, with increased satisfaction to consumers.

Modern foundries fully appreciate and endorse the business philosophy in the statement that "a satisfied customer is the best asset." They realize the fact that their customers' interests are their own. With respect to no detail is this more pronounced than in the consideration of pattern equipment. No other factor jointly controlled by user and producer has such a tremendous influence on the economical production of castings. Its importance is not limited by actual cost nor by selling price. It involves full appreciation of machine shop costs, losses due to rejections, expense of assembly, serviceability of the castings, and probable future demand for the machine or equipment in which the castings are used.

Although it is a well recognized fact that there are several standards of quality dependent on the use of steel castings, relative superiority in any class merits serious consideration. Tractor shoes plowing through mud and sand shortly after being put into service do not require the high surface perfection demanded in exposed castings on embossing machines used by Tiffany. Shifts and other surface imperfections on large housings are not as objectionable as are the same defects on parts applied to the exteriors of motor trucks.

Good Patterns Enhance Foundry Service

THE accompanying article is abstracted from a paper presented at a recent meeting of sales representatives of the Electric Steel Founders' Research Group. Such periodic conferences in which operating executives participate, are intended to inform those who merchandise the products of the associated plants regarding production and service problems of interest to consumers.

The abstract of Mr. Wheeler's paper is published by permission of the Electric Steel Founders' Research Group, the members of which are as follows: Fort Pitt Steel Casting Co., McKeesport, Pa.; Lebanon Steel Foundry, Lebanon, Pa.; Michigan Steel Casting Co., Detroit; Nugent Steel Castings Co., Chicago; and Sivyer Steel Casting Co., Milwaukee.

The author is general manager, Lebanon Steel Foundry.

But suitable pattern equipment is as important for tractor shoes and housings, as for castings that contribute to the desired symmetry of those devices that depend for their appeal partly on appearance. Patterns properly designed and constructed permit the manufacture of better castings, or cheaper castings, or castings superior both as to quality and cost, than is possible when poor patterns are supplied.

The principal considerations in determining the suitability of pattern equipment follow in order of their relative importance:

1. The quality of castings to be produced not only on initial orders, but on subsequent orders.
2. The assurance that pattern equipment will enable the foundry regularly to make the best possible deliveries consistent with the desired quality.
3. The lowest casting cost consistent with satisfactory quality.
4. The life and the maintenance expense of pattern equipment.

It is doubtful if the average buyer of steel castings is sufficiently familiar with foundry practice to understand the problems confronting the manufacturer, or the extent to which the factor of pattern equipment may influence the quality, delivery, and cost of the material. His natural queries are, "Why do you demand mounted patterns?" "Why are loose patterns not satisfactory?" "We obtained good castings from this

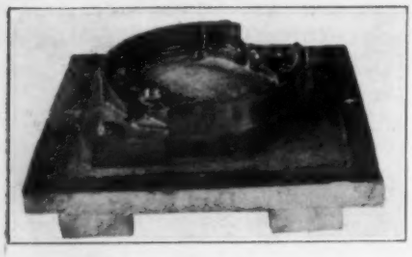

FIG. 3

mounted equipment in another foundry. Why is it not suitable for you?"

The answers to these questions are quite apparent to every foundry executive, and should be made equally so to the casting buyer, as these demands are not the result of mere whims on the part of the manufacturer, but arise from natural causes over some of which he has very little, if any, control. We will endeavor to answer these questions, dealing first with mounted patterns vs. loose patterns.

Use Of Typical Loose Pattern

Fig. 1 illustrates an ordinary loose pattern in many respects typical of loose patterns in general. Among these are its irregularity of design and the frailty of construction. The making of molds from such a pattern requires a skilled workman, whose usual procedure we will describe.

From a more or less careful study of the design the molder decides on the type of gate to use, and at what point or points it should join the pattern. He also determines the number, location, and size of the risers to take care of the steel shrinkage when the steel is solidifying. These decisions are based on his judgment or past experience.

The molder then determines from a careful scrutiny of the pattern itself, just where the parting line shall be, or in other words, to what point on the pattern it shall be imbedded in the sand, of both the drag and cope. This imaginary parting line is necessarily irregular on this pattern, and the molder must be certain that every surface of the pattern from that line to its extreme edge will draw from the sand without obstruction.

The workman must further determine the location of an imaginary horizontal plane corresponding to the joint of the flask, and must place the pattern in relation to this plane so that all surfaces on it will draw from the sand at right angles. This is imperative in the upper or cope section of the pattern, as the sand is lifted with the flask, which is guided by the flask pins at right angles to this plane. Any part of the pattern forming an actue angle with this plane will tear the sand from the mold. Although not necessary in the drag section, it is desirable to have all points of the pattern drawable at right angles to this plane.

These decisions require skill and experience, and are necessary in the making of each mold, regardless of the number made from the same pattern. A slight deviation from the correct parting line or in the position of the pattern in relation to the horizontal plane will cause the sand to break away when the cope is removed or when the pattern is drawn.

The pattern is then placed on a board, and blocked up securely under all unsupported parts, so that the compression of the sand in the drag will not distort nor break the pattern. Patterns such as illustrated are often broken due to poor judgment or carelessness in supporting them in the flask. In locating the pattern in the flask, proper allowance must be made

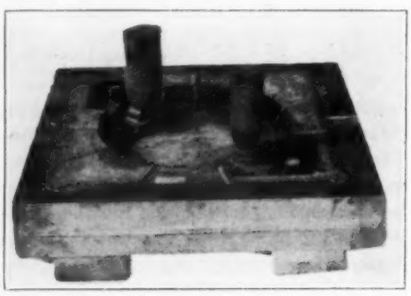

FIG. 4

for the gates and risers, as these require additional space beyond the line of the pattern itself. After the drag is rammed and rolled over, the joint of the mold is formed by means of special tools. See Fig. 2. This requires skill and experience of no small degree, as every point on the parting surface must be hard, smooth, and true. If this parting has uneven surfaces or soft spots, the compressed sand in the cope will swell into it, making a ragged joint, or causing large pieces of cope sand to remain on the drag instead of coming away cleanly when the cope is removed.

The pattern is then struck sharply with a hammer or rapping tool to loosen it from the sand. This causes rapid deterioration and is one of the main reasons why loose patterns must be replaced frequently. The drawing of the pattern is a hand operation. It requires a firm, steady, yet sensitive hand, as the line of draw is controlled almost entirely by the sense of touch. With special tools the molder then forms the pouring gate and risers.

Involves Hand Work

Nearly every operation in molding from loose patterns is hand work, and uniformity is entirely dependent on the judgment and skill of the molder. Mistaken judgment regarding risers may result in shrink holes in the casting, sometimes detected before leaving the foundry, but many times not showing up until expensive machine work has been done. Lack of discretion or care with respect to parting line causes patched molds, and castings with improper contour. Excessive pattern rapping affects casting dimensions and increases casting weight unnecessarily.

Loose patterns, especially when long and "rangy," or when poorly constructed, are apt to warp, causing dimensional errors in the casting. Loose patterns are subject to more breakage on account of their method of use, which often delays production until the pattern shop schedule permits repair work. Occasionally very small quantities are required, not warranting the expense of mounted pattern equipment, but when immediate needs or future requirements are sufficiently large, the foundry is justified in demanding mounted patterns, from which customers will derive benefits fully justifying the costs involved.

Compare the method described, with the proper use of suitably mounted patterns, as illustrated in Figs. 3 and 4. The parting line and the imaginary horizontal plane have been fixed in the pattern shop where necessary tools are available to accurately determine

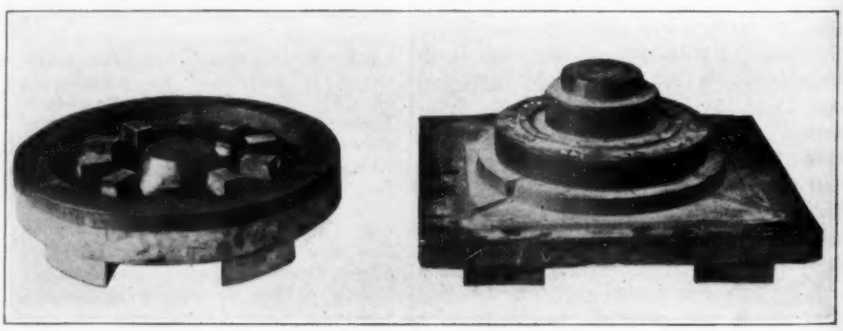

FIG. 5

these locations. The pattern is secured to a board or placed so that its relative position will remain fixed.

The proper sizes and locations of pouring gate and risers have been determined through experimentation. As these are to become permanent parts of the pattern equipment, sample castings are made, checked dimensionally, and examined internally to ascertain if the gates and risers are properly located and of the right sizes to insure sound castings without wastage.

Molding Details Vary

While the details of molding operations with mounted patterns vary according to the types of machines employed, the skill required for their proper use is much less than that needed for molding loose patterns. Many important factors affecting the quality of the castings are satisfactorily provided for only by the use of mounted patterns. Vibrators substituted for hand rapping loosen the pattern from the sand without injury to pattern or mold. Following this, the pattern is withdrawn steadily and smoothly, as this operation is controlled by flask pins and is further assisted in some cases by mechanical movement. Speed of production is increased since before the work of making the mold is started, no time is lost in considering the peculiar characteristics of the pattern which govern the arrangements for gate, riser, parting line, and other important details. All of these items are satisfactorily regulated by permanent portions of mounted pattern equipment, the use of which minimizes wear and abuse, with resulting benefit to the casting.

The occasional request for mounted equipment of a kind suited to a foundry's particular practice sometimes is regarded by a consumer as an exhibition of an arbitrary attitude, if other mounted or gated patterns used successfully in another foundry were furnished. Lack of familiarity with foundry conditions on the part of many users of castings often makes advisable a clear, concise explanation.

Every foundry can produce a greater number of satisfactory castings per man-hour from one kind of pattern equipment than from another. This may be due to the special training of the organization along well defined lines, or to the use of certain types of equipment and kinds of materials.

The fact that methods vary in different foundries is no indication that one method is right and all others wrong. It would be absurd to state that one type of automobile motor is the only good design, and that all motor car manufacturers should adopt that type. Each designing engineer, working along his own lines has accomplished certain desired results, indicative of progress toward an ideal for which all are striving.

In the old days preceding our present keen competition and intensive production, foundries accepted any kind of pattern equipment which might be furnished. As cost and production were of minor consideration, judged by our present standards, satisfactory castings were produced from such equipment. These conditions have changed, and the fact that each foundry has developed and improved its methods of manufacture, necessitating various kinds of patterns, is an illustration of progress.

FIG. 7

One foundry may have developed a very extensive use of cores, and in so doing, may have become very proficient in their manufacture and application. This condition may have been created by the character of work usually produced in that shop. Another foundry, to a relative extent, may have neglected the core room and may have concentrated effectively on molding methods to obtain corresponding results. Castings of the same design and size produced in either foundry might be of equal quality at the same cost, but to accomplish these results pattern equipment of different design and construction would be required.

FIG. 8

As another example, one foundry having skilled labor in abundance may have developed reasonably good production with the use of comparatively simple patterns. Another foundry, without available skilled labor, may have been forced to the use of expensive machines operated by unskilled labor, which, after development, enables it to produce at the same or lower costs, equally satisfactory castings.

Equipment May Vary

A third example might be that of a foundry that has highly developed the use of any one or more of the many types of molding machines, such as straight squeeze, straight jolt, jolt squeeze, jolt roll-over, jolt roll-over draw, roll-over draw, squeeze roll-over draw, jolt stripper, and others. Proficiency is acquired by the continued use of any one of these types, but the pattern equipment best suited to each may differ greatly.

It should be apparent to any student of this problem that the foundry is justified in demanding the type of pattern equipment to which its men are accustomed, which will permit applications to its machines, and which will render the greatest production per man-hour. Additional examples of these differences in foundry practice requiring special pattern equipment could be given, but the above should be sufficient to illustrate the fact that many differences exist, and these

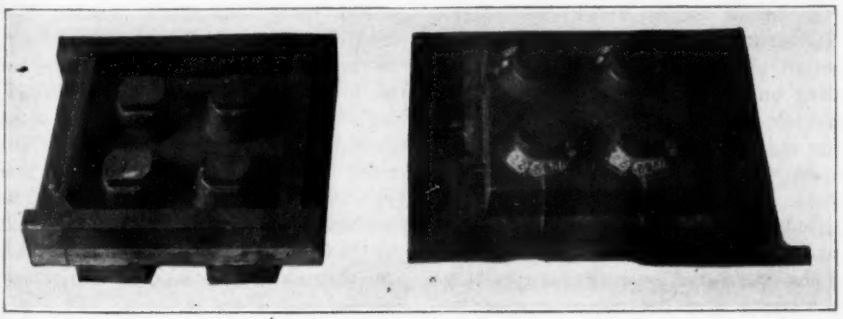

FIG. 6

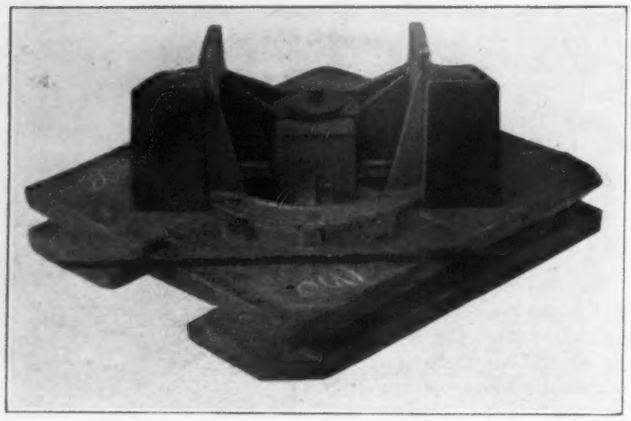

FIG. 9

differences are due to logical causes.

One foundry because of regular practice and local conditions may be able to produce the best castings of certain designs by the use of dry sand molding. The shop may not have made sufficient improvement in its facing sands to produce such castings satisfactorily in green sand molds. Another foundry, whose general character of work would not necessitate the use of mold drying ovens may have been confronted from time to time with certain castings quite difficult to produce in green sand, and consequently may have developed a superior facing sand, which, in connection with cover cores or other special features has produced equally satisfactory castings. The kinds of pattern equipment suited for these two methods are necessarily different.

Some foundries specialize to a great extent in the making of very thin sectioned, intricate work, which requires metal of extremely high temperature. This hot metal may increase the amount of shrinkage for which provision is made, in certain designs of castings. It may be necessary to use a different shrinkage allowance in making the pattern. In some cases castings must be poured in positions differing from those ordinarily observed in foundries using relatively colder metal. In such circumstances, patterns suitable for the one foundry may not be suitable for the other.

Examples Are Cited

It is not the purpose of this paper to advocate any particular method of foundry practice. But to more clearly illustrate some of the points mentioned above, we will give several examples, showing how we have been able either to effect a material saving in production cost or to produce a more satisfactory casting.

Figs. 5 and 7 illustrate pattern equipment and a wheel hub casting used by a motor truck manufacturer. The pattern equipment when received consisted of cope and drag board, for making the entire casting in green sand, excepting the core for the center.

Anticipating shrinkage trouble in the several flange bosses, we concluded risers were necessary over each boss. To simplify molding and to insure proper pouring so that hot metal would enter each riser, making it effective, we made cover core equipment as illustrated. The results were satisfactory and the castings were machined without showing flaws. Incidentally, we have learned that another foundry, using the original equipment, had twice filled orders for castings, practically all of which had been rejected on account of shrinkage in the flange bosses; and that these flaws had not been detected until expensive machine work had been done.

Fig. 6 illustrates the pattern mounting for a small bevel gear blank. The original equipment furnished consisted of one loose pattern which was used on the initial order, resulting in a very high molding cost. The cleaning expense was excessive, as the castings were gated on the beveled surface, which required very careful grinding to contour. On a squeezer machine the mounted pattern equipment illustrated produces four castings per mold, and the cleaning operation is simplified, as the gate enters the riser, which necessitates grinding only on the flat surface of the hub.

Fig. 10 shows a well mounted pattern for a box-shaped motor truck bracket. The original design necessitated a dry sand internal core. It was almost impossible to produce satisfactory castings on account of shrinkage cracks, and the castings so made carried a very high cleaning cost and were never entirely satisfactory.

These difficulties were discussed with our customer, who permitted us to remove the lower web and to increase proportionately the side walls, thereby maintaining the desired calculated strength. Following this change, the interior was made in the green sand of the mold, eliminating cracks, and reducing the time and expense of finishing. The general appearance of the castings was superior to that of the castings furnished from the original pattern, and as no shrinkage difficulties developed, the strength of the castings was materially increased.

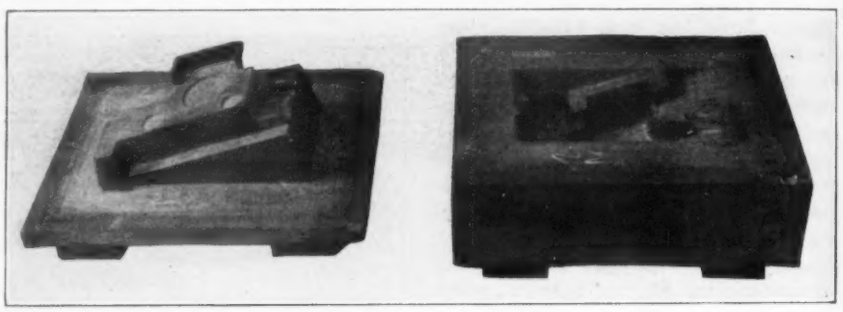

FIG. 10

The influence of these changes on delivery was marked. From experience, every foundryman knows the effect on delivery of a high-cost, slow moving, cleaning room job. It is the writer's opinion that this has been one of the greatest factors in broken promises. When changes in pattern equipment or design speed up the finishing process, customers can be assured of better deliveries than were previously made.

Fig. 8 illustrates a differential housing. The pattern as received necessitated the use of a dry sand core which caused many shrinkage cracks. To expedite a required quick delivery, the pattern was used as received on the initial order, and a high percentage of the castings was rejected after machining work. We requested entirely new equipment, which on this type of job is quite expensive. The castings subsequently produced with the new equipment were entirely satisfactory, and not one of the many shipped has been rejected.

(*Concluded on Page* 1498)

Seeks Material for Hot Molds

Centrifugal Tube Casting in Hot Molds Presents Many Difficulties—No Satisfactory Mold Materials Now in Use—Chromium-Tungsten Lining May Solve Problem

By Leon Cammen

USING hot molds in centrifugal tube casting is a matter of necessity, not of choice. Where the metal is of such a character that it can be superheated without injury, and where the weight of the casting is large, all that is necessary is to maintain the mold at a temperature (approximately 350 degrees Fahr.) at which no deposits of moisture can form thereon. Where, however, the amount of metal cast is small as in tubes of small diameter, 3.5 inches inside diameter and 4.25 inches outside diameter for blanks used in making hollow billets for drawing small tubes, and the length of the casting considerable that is, 60 to 90 inches, metal delivered to the mold from one end simply will not flow in a mold that is merely warm.

The writer, in his work, encountered many instances where, through some trouble in handling the hot mold, the latter was colder than it should have been at the time the metal was teemed. The invariable result was that the tube cast was too short as it did not fill the mold from end to end.

Except from the patent point of view, it does not matter how the mold is heated. In the Stokes and Hurst-Ball methods used only with cast iron, the molds are kept hot by making one casting after another at such a rate that the mold is maintained at the desired temperature. This is, of course, the ideal method where it can be used, as it eliminates the external heating of the mold and the rather bothersome handling of the big hot mold body between furnace and casting machine. This process is, however, applicable only to cast iron and only to the castings of tubes which are either of very large diameters, or compensate for the smaller diameter by being short. This is due to the fact that where long tubes of small diameter, are cast the contraction on cooling is so small that it becomes necessary to let the casting cool quite materially before the necessary force can be applied to effect the stripping. Where this is done, obviously, the mold will become too cold to handle the next casting, and reheating by external means other than the metal of the casting becomes necessary.

Another feature, applying particularly to steel and special ferrous alloys of low-carbon content also contributes to the necessity for using a hot mold centrifugal tube casting. Assume that you are casting a steel tube, to be used as a hollow blank for a seamless tube mill, 8 feet long, 10 inches outside diameter and 7.5 inches inside diameter. The weight of metal in such a tube is so large that, with a spout extending into the mold for a distance of say 4 feet, there is no trouble to deliver metal in such a manner that a tube of uniform thickness from end to end will be formed even when the temperature of the mold is only 350 degrees Fahr. This does not mean, however, that the tube will be good.

Thin Shell Is Formed

As the first metal is delivered against the fairly cold wall of the mold, it forms a thin tubular shell which immediately contracts on cooling, with the result that the cast tube lies loose in the mold. This condition is aggravated still more by the fact that the mold, heated by the contact with the hot metal, expands. The result of the combination of these two conditions is that the cast tube, while subject to centrifugal stresses in the process of its formation, receives no support from the mold. The centrifugal stresses in this case are fairly large, 75 to 100 pounds, per pound of metal cast, while the mechanical strength of the shell of a centrifugally cast tube, with molten metal all the time coming on top of it, is naturally low, and cracking of the cast tube results.

The foregoing explains why tubes cast in cold molds as a rule crack longitudinally and not radially. The centrifugal stresses in a tube in the process of being cast are essentially the same as those produced by water pressure in a cylinder, and it is common knowledge that that is why cylindrical boilers usually are single riveted in the circumferential seams and double or triple riveted in the longitudinal seams. This cracking does not occur in casting in a highly heated mold, first because the casting does not contract away from the mold until after the spinning has ceased, and second, because the mold itself is so hot that contact with the cast tube does not produce expansion to any material extent.

Materials for heated molds in centrifugal tube casting are not secured easily, because such molds must satisfy several requirements. In the first place, the mold must not scale and waste away because of the constant application of heating. Next, the mold must retain sufficient mechanical strength at temperatures of the order of 1300 to 1600 degrees Fahr., at which temperatures the strength of cast iron is negligible. Not only must the mold material retain its mechanical strength, but also it must retain its hardness, as otherwise the rather rough handling between the furnace and casting machine would throw the mold all out of shape. Only such alloys as nichrome and the high chromium-iron alloys, such as Becket metal, can satisfy this condition. These metals retain practically their full hardness up to a certain temperature limit, which varies from 2000 to 2250 degrees Fahr., depending on the composition of the metal, and then somewhat suddenly collapse completely.

Next, the coefficient of contraction of the mold material must be not higher, but if possible lower than that of the cast tube. In cold mold centrifugal tube casting, the cast tube contracts while the mold is expanding, both actions helping to free the cast tube from the mold and facilitating stripping. In hot mold casting there is no expansion of the mold through heating, and mold and casting go through the same temperature reaction. If then the mold on cooling should contract faster than the casting, there will be an obvious danger of gripping of the cast tube by the mold, which would make stripping the tube impossible. Ni-chrome, for example, has a higher coefficient of contraction than steel, which makes

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From a paper presented at the annual convention of the American Foundrymen's association, at Detroit, Sept. 27 to Oct. 1, 1926. The author, Leon Cammen, is associate editor, American Society of Mechanical Engineers, New York.

the use of nickel-chrome molds, notwithstanding their thermal properties, undesirable. The rate of contraction of Becket metal is approximately the same as that of steel. Another requirement which none of the materials previously enumerated satisfies, is, ability to withstand with impunity the terriffic temperature of molten steel. To be capable of this, the mold material should be such as to melt at a temperature far above that of steel, and there is none that could be used for mold making that would do this.

In an effort to obtain such a material, a series of tests have been undertaken since 1921. The extremely high melting point of tungsten naturally directed our attention to this wonderful material, and after a certain amount of rather strenuous work, we have succeeded in finding a method for melting it without oxidation or obsorption of hydrogen. We never have succeeded, however, in melting more than 4 pounds at a time, and while we have obtained little ingots that we are using for drawing wire, we have come to the conclusion that it would not be possible to meit by this process the thousands of pounds necessary to make commercial molds for tube casting.

We next tried a process somewhat similar to calorizing as developed by engineers of the General Electric Co. There was no special trouble in securing some penetration of tungsten into the body of steel when the latter was selected properly as to analysis, but, while certain otherwise interesting properties were imparted to steel so treated, the melting point of the metal was not affected to any appreciable extent. We then proceeded to develop a method for creating on the inside of a low carbon steel or wrought iron mold a lining ⅛ to ¼-inch thick, consisting essentially of tungsten, chromium and a quantity of iron.

With somewhat limited facilities employed thus far, we have not been

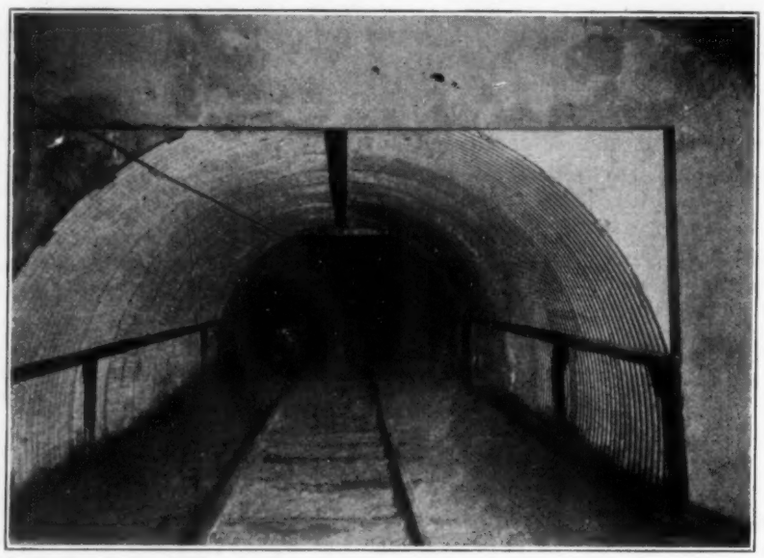
Constructs Mine Overcasts from Sheet Metal

ONE of the most recent applications for sheet metal is in the construction of mine overcasts, it being claimed that the new type of construction reduces costs to about one-third of previous costs and has numerous advantages over temporary wood structures. According to the Standard Coal Co., Salt Lake City, Utah, which introduced the new design, the overcast is built in the form of a large, inverted half-round with sections of galvanized, corrugated iron, as shown in the accompanying illustration. The corrugations make the metal strong enough to serve as a good support for overlying earth and a protection from falling rocks. If desired, it can be made water-proof and air-tight, a feature greating facilitating mine ventilation.

The overcasts are installed in places where haulageways cross air courses at right angles and where it is necessary to maintain the haulageways on level or even grades. The air passes above and at right angles to the haulageway overcast. In the installation, the roof is "shot down," or blasted, for about 9 or 10 feet where the air course is to pass over the haulageway. The roof gradually slopes downward on each side of the overcast so that the capacity of the air course is not decreased at the intersection.

Metal overcasts can be erected in much less time than concrete and they can be taken down and moved to another location with little difficulty. The corrugations in the metal enable it to withstand much rough handling in transportation. Being absolutely fireproof, the metal overcast satisfies mining laws requiring fireproof materials.

The length of the overcast designed by the Standard Coal Co. is 14 feet, seven corrugated sheets, each 2 feet wide, being placed side by side. Each of the sheets is 12 feet long and is curved on a 6-foot radius. The height of the overcast at the top is 9 feet and its greatest width 12 feet. For a short distance at the bottom it is a few inches less in width. Because the filling for the track and ties comes up on the iron some 6 or 8 inches, the bottom is hidden.



Material selected for the overcast was 14-gage ingot iron manufactured by the American Rolling Mill Co., Middletown, O., the selection being made because of the corrosion resistance of the material. Moisture, coal dust, sulphur and smoke in coal mines are strongly resisted by ingot iron, being practically free from rust-promoting impurities, resists rust. This iron is used widely in coal mines for other purposes, such as mine cars, conveyors, tipples and chutes. For further protection, a coat of paint frequently is applied. Although this overcast was designed for use in coal mines, it is suitable for almost any other kind of mine with a horizontal entry, air course or similar construction.

able to line tubes larger than 6 inches inside diameter or longer than 36 inches, but while the manufacturing details remain to be worked out, the problem may be considered to have been solved in its essential features.

Protecting Mold Surfaces

All hot molds used in centrifugal tube casting have to be protected from the solvent action of molten steel. This may be done in several ways. Where an extremely low carbon steel is used, a layer of oxide on the internal surface of the mold will be satisfactory. It is not sufficient, however, where the carbon content exceeds say 0.08 per cent, as there the oxide on the surface of the mold is reduced by the carbon in the steel, gas is formed and as it has no other way to get out except through the metal, blowholes result. These blowholes, by the way, have a peculiar shape, somewhat like pears, with the thin end toward the mold.

The writer has tried several combinations including clay, kaolin, etc., but ultimately came to the conclusion that the best material is castor oil, alone or with enough lampblack to bring it to a molasses-like condition. This should, of course, be applied before the mold is heated. In this connection might be mentioned a curious thing about castor oil which the writer had occasion to note in casting duralumin tubes some years ago. The molds were heated to about 1200 degrees Fahr. after having a coating of castor oil applied to them. When the cast tubes were withdrawn, they had an outside surface as smooth as glass, and were actually wet with oil.

Temperature of Hot Molds

No general formula for determining the temperature of hot molds in centrifugal casting is available. It depends on the freezing characteristics of the metal cast, thickness of wall of the cast tube, length of casting, and several other features. As a general rule, it may be stated that it is advisable to teem the metal as cold as possible, even when this means heating the mold to an especially high temperature. When the metal to be cast is superheated, an enormous quantity of heat is released at the time of freezing of the metal, and there is serious danger of the mold burning out. We had several instances of this in casting stellite which melts at a temperature much lower than steel, but is cast in a superheated condition. In casting monel metal, however, melting some 400 degrees Fahr. higher, we never had a case of a mold burning through.

Centrifugal casting in hot molds has a certain field in which it has to be used simply because we know of no other way to accomplish the same results. It is a new art, less than five years old, and there are still so many problems in it to be solved that it is therefore not to be undertaken by amateurs. In fact, a very high grade of engineering and metallurgical ability is required to carry it on successfully. Some very interesting results have been obtained by centrifugally casting tubes in hot molds; the art is in strong hands, and many of the difficulties in the way already have been overcome, while earnest work is being done to eliminate other difficulties.

Review of New Books

Wage Situation Clarified

Wages in the United States by the Nation Industrial Conference board, 247 Park avenue, New York; 153 pages, 6 x 9 inches, cloth binding; published by the conference board, and supplied by IRON TRADE REVIEW at $2.50, net.

The importance of complete and reliable information pertaining to wage changes in industry does not need to be emphasized; employers, business executives, and students of economics regard it as indispensable. While there are many agencies, including the government, compiling wage statistics, none of them performs the service to industry for which the conference board has become recognized. It simplifies and correlates a tremendous amount of data, puts it in the form that can be grasped most readily by the average business man, prints it in large, readable type and illuminates it with good clear charts. The present volume, the twelfth publication by the board in this field, reflects the continued expansion of the scope of its studies. To the basic results of its investigation of trends in major branches of manufacturing there have been added the findings of its studies of wages in railroad transportation, anthracite mining, building construction, gas and electric plants. While the study covers the period from July 1914 through March 1926, in 25 manufacturing industries, the data presented in the text, tables and charts extends back many years, for comparison. The book contains 17 tables and 17 charts.

* * *

Suggests Cost System

Foundry Cost Accounting, Robert E. Belt; second edition; cloth, 267 pages, 6¼ x 9 inches; published by the Penton Publishing Co., Cleveland and supplied by IRON TRADE REVIEW for $6, postpaid, and in Europe by Penton Publishing Co., Ltd., 2-3 Caxton House, Westminster, London, S.W.1, for 30 shillings, net.

Robert E. Belt, secretary, American Malleable Castings Co., Cleveland, is exceptionally well fitted to speak with authority on the subject of foundry costs. Years of experience in practical cost work, an intimate contact with one of the most highly organized branches of the foundry industry and an uncommon insight into the economic phases of castings manufacture have been brought to bear on this second edition of his cost accounting work.

The new edition is entirely revised and extended to cover in much more detail many of the important phases of foundry costs. The author has made a close study of the peculiar problems encountered in the various branches of the industry and includes his recommendations for procedure in establishing and operating cost systems in gray iron, malleable and steel foundries, each of which differs in important essentials from the others.

An example of his method is found in the chapter on gray iron foundry costs. He takes cognizance of the fact that gray iron foundries commonly are smaller manufacturing units and accordingly the forms and distribution of accounts is simple. He presents a production order form carrying all the information necessary for following the work through the plant. This is supplemented by a production order tag to accompany the pattern, and a complete order record for office information. Complete records for metal stocks, cupola charges, etc., take care of this phase of costs. Pattern production and storage forms are recommended. Daily and weekly production cards are provided for molders and coremakers. Costs on tumbling and sandblasting are compiled separately. In conclusion a complete analysis of various classification of direct and indirect costs is offered, followed by summaries. Similar details are given with the requisite variation due to the different manufacturing processes encountered in making malleable and steel castings.

Introducing Grinding Methods Was Discouraging Job in 1900

By Charles H. Norton

TIME is a wonderful transformer of our most bitter sorrows into pleasant memories, and has, no doubt, gotten in its work with all of us, and now we can recall incidents, some of which at the time were not so pleasant as they now seem when looking backward.

I remember the sale of the first machine to Mr. Hoe of the printing press company, New York. When it arrived there, the canvas that covered it on a flat-car had been stolen on the way and the machine was covered with fine sand. A thorough cleaning was necessary.

They took it all apart, cleaned and inspected each piece for workmanship; then reassembled it, complimented us on the workmanship but cautioned us to be more careful when shipping; but they paid the full price and gave us splendid co-operation to make it succeed. I have never forgotten their kindness.

I remember the expression on Mr. Allen's face when I returned from Vermont where the second machine was placed, and payment had long been delayed, because after the grinding machine had produced twice as much work as their lathe-man had for years been producing, this lathe-man braced up and produced over three times more than he ever had before the introduction of the grinding machine. For this reason they did not wish to pay for the machine. It had been a long drawn out case and my trip there was to end the case if possible, either by payment or by the return of the machine. I came back to Worcester after several days, and putting on a long, sorrowful face I sat down by Mr. Allen with the remark that I had learned by this experience never to sell another machine to a plant of that character. He said: "I thought it would turn out this way." Just then I drew from my pocket a check for $2500, in payment for the machine. I have never forgotten the facial change that came over him; and after all the years, I think I still feel the twinges in my back and shoulder where he administered a sound punishment for my deception.

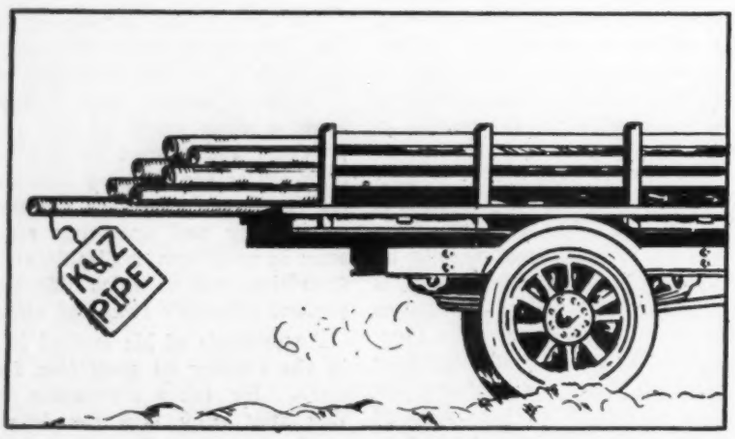
Oh! what a thrill when a cable came from London ordering a machine and no machine ready to sell; and then orders for more until seven were shipped to England, and then later the report that the people could not

Pioneering Is Hard Work

RECOLLECTIONS of the early days in the development of any industry are invariably interesting. This is particularly true in the case of pioneering work in grinding.

The accompanying article is from excerpts taken from a recent impromptu talk by Charles H. Norton before a group of employes of the Norton Co., Worcester, Mass., who have been in the service of the company for 25 years or more.

Identify Your Product



A Red Sign on the Truck Load Is Better Than Conventional Red Rag

IN MOST cities, loads on motor trucks which extend appreciably beyond the end of the truck body are required to carry a marker or flag to warn other traffic and pedestrians of the danger of the overhanging material when the truck turns. In perhaps 99 out of 100 cases, this ordinance is complied with by fastening a red piece of cloth to the projecting material.

Recently, one warehouse company improved on this practice by using a bright red card bearing a printed reference to the product carried. When one of the company's trucks is delivering pipe, a card designating the make of the pipe is affixed to the projecting load, as shown in the above illustration. The red card has the advantage of warning of danger and yet has a high educational and advertising value inasmuch as it identifies the pipe and helps establish the name of the manufacturer in the minds of those who see the card.

The practice is worthy of adoption for other materials. Structural steel being carried to point of erection might be marked similarly with a red card bearing the name or trade mark of the fabricator. Machinery which extends beyond the tailboard of the truck might also be marked with the name of the manufacturer.

use them because they did not know how to use them, and a request for me to go there with a demonstrator.

Then when there, Mr. Sjolandler demonstrated them, set them all to work, and set at rest the claim that "it could not be done." There were many very amusing as well as trying incidents during that trip in 1902.

A Skillful Demonstration

I must not let this opportunity pass without telling you of a very skillful demonstration by Mr. Sjolandler in the show room at London. Our agent had told some army officers that we could grind a 2-inch piston rod, six feet long, from the rough in one-half hour. This statement aroused much interest and some doubt as to our veracity. At the appointed time two officers from Woolwich Arsenal arrived with an English machinist carrying the bar of steel, and all stood by to see the "American trick" and, just as Charlie had the bar in the machine, the workman handed a solid 2-inch ring to him and said "fit it to this ring." Of course, we did not expect to fit it to a ring but expected some limit as to size, but here was the ring; and the expression of "I dare you" on the face of the English machinist gave us something to think quick about. Charlie's whisper, "What shall I do" came to my ear in a guarded instant, and after a brief conference he went to the tool room and came back with a 2-inch arbor. Placing the arbor in the ring, he noted the place where the ring was just barely tight, then setting the micrometer to fit that place he began work. When finishing to size he carefully adjusted his micrometer again, and tried the micrometer on the work over and over again, and in the specified time he completed the work and handed the rod and ring to the machinist and said: "Put it on." The workman said: "Ye 'ave not fitted it to the ring." Charlie replied with perfect confidence and quite sharply: "Put it on." The workman did not succeed in putting it on and there followed the usual "I told you so" attitude, but Charlie took the rod and ring away from him and carefully cleaned and oiled the ring, and I suspect he hoped to warm it somewhat by handling it carefully, then he carefully placed it on the rod and pulled it slowly the whole length, off the other end, a perfect fit. I consider this the most skillful demonstration I ever saw.

Offers Opportunity

It may appear that there is never to be another opportunity for a great stride ahead as that of the last 25 years. But I cannot but believe that opportunity will be as great; but that machinery and methods of another 25 years may be very different from the machines and methods which we are employing today.

The fact that more is known of grinding now than in 1900 is in my opinion evidence that large advances will be made during the next 25 years.

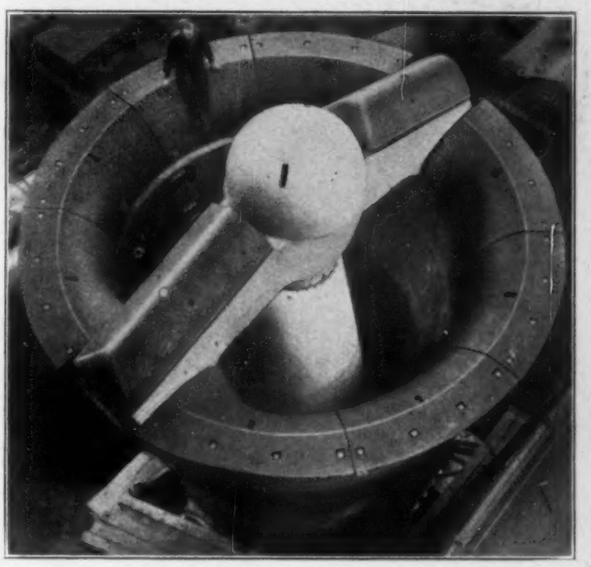
Largest Ore Crushers Are Shipped to Chile

ALLIS-CHALMERS MFG. CO., Milwaukee, has established another record for heavy machinery which it manufactures by building and shipping what are said to be the two largest ore crushers in the world. These crushers, weighing 500 tons each, were designed and constructed for the Chile Exploration Co., a subsidiary of the Anaconda Copper Mining Co., for installation at Chuquicamata in the Andes mountains near Antafegasta, Chile. Because of the hardness of the copper ore which they must handle, the crushers are of an especially heavy design, built almost entirely of steel, the castings and forgings being among the largest ever made in the country.

Two hopper openings each 5 feet across permit a carload of ore weighing 70 tons to be dumped into the crusher at one time. Some pieces of ore will weigh as much as 7 tons. This will be reduced to a 12-inch product; each crusher handling from 2000 to 2500 tons per hour. The problem of shipping the extremely heavy parts of these machines has been complicated further by the fact that they must be built in sections to facilitate handling in transit and final transportation in the mountains. The largest pieces weigh 60 tons each.

Shipment to New York will be made by rail, 25 freight cars being required. At New York, shipment will be loaded on the Chile Exploration Co.'s steamer, CHILCOP, which is specially equipped with heavy derricks for handling this machinery. Proceeding by way of the Panama canal, the shipment will follow the west coast of South America to Mejillones, a port near ANTAFOGASTA, where owing to the lack of harbor on the Chilean coast, the machinery must be transferred to cars on a 30-inch narrow-gage railroad. Over this mountain railroad, the shipment will be carried to the mine at an altitude of 9500 feet, or more than three-fourths of a mile above sea level. The steep grades and sharp curves and weight of pieces to be transported, necessitated the building of special cars.

Thus, in designing these large crushers, which



are of the McCully gyratory type, the engineers were confronted with the problem not only of designing the largest machines of this type ever built, but had to take into account also the question of shipping them over 5000 miles under most unusual conditions.

Industrial Furnaces

A Treatise on the Design, Construction and Function of Modern Melting, Heating and Treating Units

By Charles Longenecker

Chapter IV—Reheating or Finishing Furnaces

THE term reheating furnace here is used to designate a furnace in which blooms, slabs or billets are heated to a temperature at which they may be rolled into the finished or semifinished form. The term represents a class of furnaces, not a type. In the early days of the steel industry the finished product was rolled direct from the ingot. No intermediate stage existed until blooming and slabbing mills were built and then with the production of blooms, slabs and billets, the reheating furnace came into use. In the iron industry the same furnace is utilized, not, only for the initial heating of the piles, but also for any subsequent heating; in certain branches of the steel industry, the same procedure is followed. Furnaces used in this manner cannot be designated as reheating furnaces because they also are employed for the initial heating. The distinction is one of position rather than design.

Besides the stationary hearth reheating furnaces, there also exists the continuous hearth design which rapidly is growing in favor. This latter type furnace will be fully discussed later. Reheating furnaces of the stationary hearth type, are either of the reverberatory, end-fired design, or of the recuperative or regenerative construction. The regen-

FIG. 29—GAS-FIRED FURNACE IN WHICH SLABS FOR THE PLATE MILL ARE REHEATED. THE CHARGING MACHINE IS SHOWN IN THE DISTANCE

erative form is the most acceptable in plants where the tonnage heated is large enough to warrant the initial outlay.

Fig. 30 shows a heating furnace of modern design. It is interesting to note that the first regenerative furnace built by Siemens practically was identical in general features, to that shown. This furnace, erected in 1867 at the Barrow Haematite Steel Co., reheated bessemer steel and it was here that Siemens, after watching the operation of the furnace, conceived the idea of melting steel in a furnace of similar design but with the hearth altered to a more suitable form. The following year the construction of furnaces for the production of steel on the open hearth, was started at Landore, near Swansea, Wales. Thus Siemens' reheating furnaces was really the parent of the open hearth.

The regenerative heating furnace finds its most attractive field in the heating of blooms and slabs thicker than 5 inches. Such slabs and blooms are rolled into plates, rails and structural shapes etc. Steel of this thickness and under is heated more economically in the continuous hearth type furnace but there is no definite thickness which determines the line of division in the choice of the furnace. Other factors which influence the selection of either the stationary or continuous type of furnace include the composition of the steel and the demands of the mill. Alloy and high-carbon steels should not be subjected to a sudden change of temperature but should be brought slowly to a rolling temperature. Hence for steels of these grades reheating furnaces of the continuous type usually are operated with marked success.

Choosing Desirable Furnaces

Where the demand of the mill is for steel of uniform thickness the continuous furnace also should be given preference; but, if the orders call for slabs or blooms varying in thickness, the stationary furnace is the more serviceable. When blooms and slabs of uneven thicknesses are charged indiscriminately in the continuous furnace there is danger of overheating the thinner pieces before the thicker sections are at rolling temperature. Moreover, the length of the stock to be heated frequently is not uniform in which case the continuous furnace is less desirable as the hearth will not be covered completely. The foregoing features must receive consideration but there may be others of a local character, which may have greater significance in individual plants.

The regenerative furnace follows the open hearth in principle but with some pronounced exceptions as to operation. It is these exceptions which permit a much simpler design. The flame temperature in the open-hearth furnace approximates 3000 degrees Fahr. while in the reheating furnace 2400 to 2600 degrees is sufficient. This drop of 400 to 600 degrees allows a much simpler port and roof construction. In the open-hearth furnace the flame should sweep the bath while in the reheating furnace the flame will cut the blooms or slabs if it strikes them. Hence, it is directed is such a manner that it clings close to the roof. The complicated port and roof construction necessary to give the flame direction when melting steel, is not required when heating steel because the lower roof fulfills this function. Neither is it imperative that combustion be completed immediately in front of the gas port. Unburnt gases, however, should be consumed before the exit ports are reached. Simplification further is effected by the omission of slag pockets and a less elaborate construction of the regenerators.

The use of magnesite for covering the hearth, has made possible a

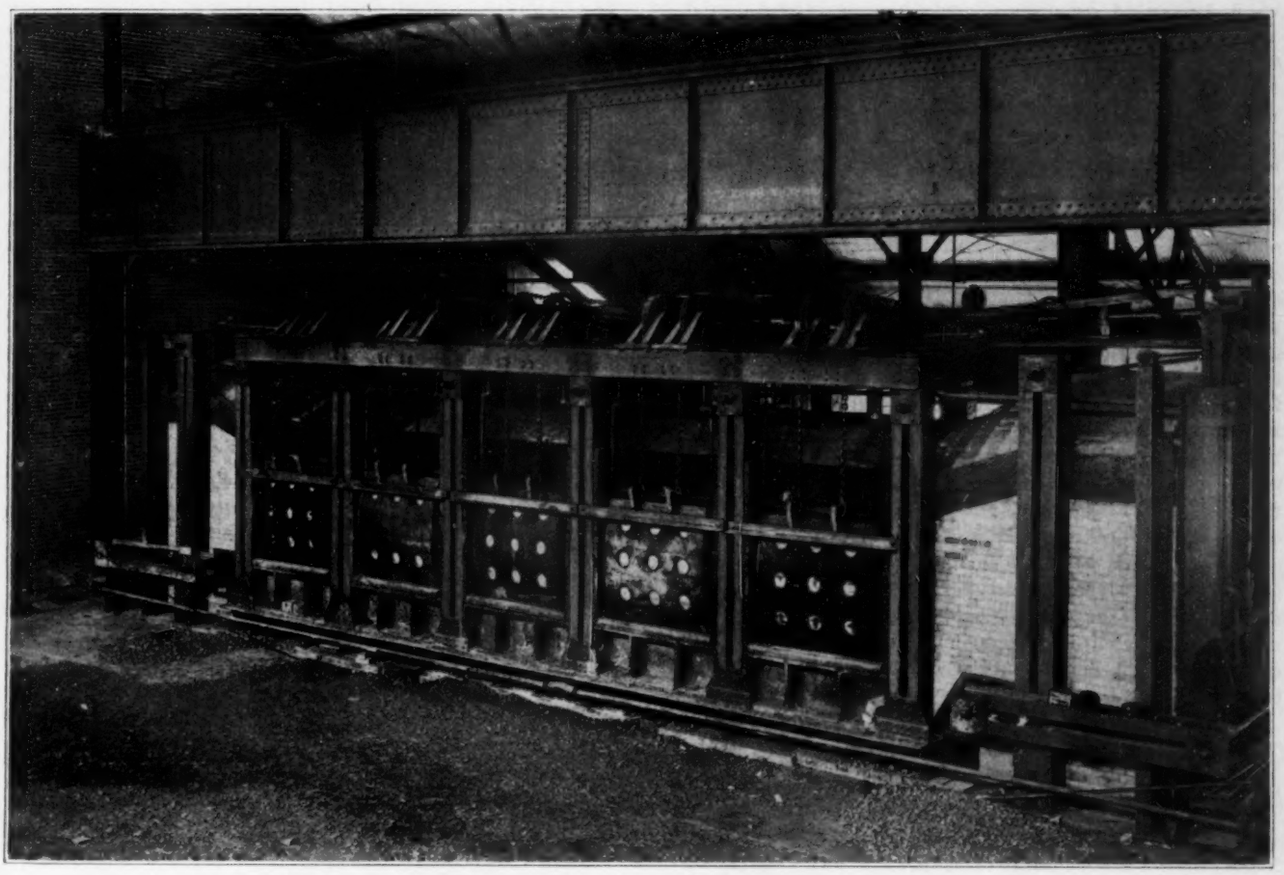


FIG. 30—GAS-FIRED FURNACE OF THE REGENERATIVE TYPE FOR REHEATING LARGE BLOOMS AND SLABS FOR ROLLING INTO PLATES

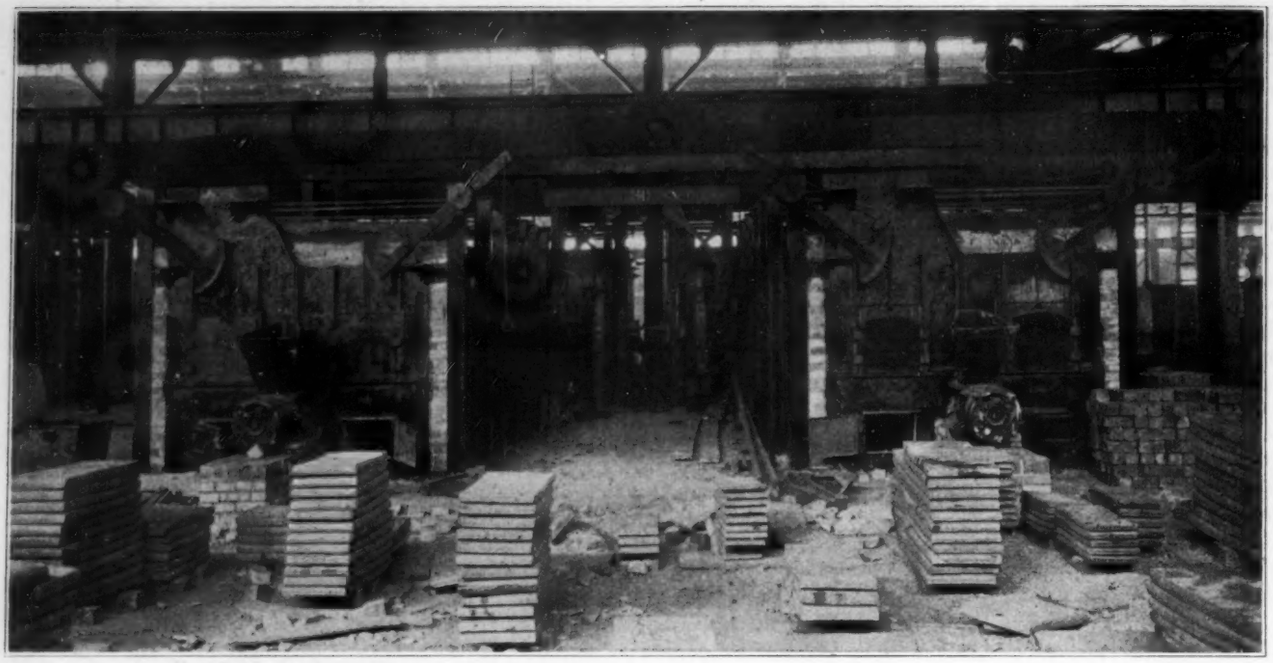


FIG. 31—STOKER-FIRED FURNACES FOR REHEATING SLABS. THESE UNITS ARE OF THE STATIONARY HEARTH TYPE

greater utilization of the cinder, which results from the scaling of the metal, as a source of iron in the blast furnace. Where sand instead of magnesite is spread over the hearth, the silicious content of the cinder is too high to make its use attractive as a substitute for ore.

Regenerative reheating furnaces operate at an efficiency range of 25 to 40 per cent. Regenerator efficiency will be close to 50 per cent.

Fuel consumptions fluctuate according to the analysis and size and quantity of material heated. On a production of 171,398 tons of 6 x 6-inch and 8 x 8-inch blooms a year, a regenerative furnace at one plant consumes from 156 to 302 pounds of coal per ton of steel heated. The coal is gasified in gas producers. In the same type of furnaces, 3500 to 4000 cubic feet of 525 B.t.u. coke oven gas, is required to heat a ton of steel blooms, 6 x 6 inches. At another plant using a reverberatory, stoker-fired furnace 117,851 tons of blooms, 8 x 8 inches are heated with a fuel consumption of 472 pounds of coal. Similar sized blooms when heated in a furnace of the same design, but hand fired, required 571 pounds of coal a ton, on an output of 37,615 tons of steel.

October shipments of domestic water pumps and water systems, totaled 7463 units, with a sale price of $542,128, compared with 7534 units in September and $563,065 total sales price, according to reports of 21 manufacturers to the department of commerce.

Buyer Should Have Good Pattern Equipment

(*Concluded from Page* 1490)

Fig. 9 illustrates a road scraper bolster casting, having deep pockets and thin high ribs. The original pattern furnished was of wooden construction, and as the ramming of the sand had a tendency to distort or break the ribs, it was difficult to draw the pattern without tearing the sand. The castings produced from such molds were far from true, and the excess metal was sometimes prohibitive. Repair work was necessary very frequently, which always delays production. We requested metal equipment which has now been in service several years, resulting in the elimination of repair work and delays, and in the production of castings uniformly satisfactory.

Numerous instances of similar character could be enumerated where the change to suitable pattern equipment has effected economies in production or improvements in quality. What we have given should be sufficient to justify the foundry's demand for suitable patterns. The customer's cooperation is essential, as this is the one point of contact where his actions will influence the production cost. Other factors controlling production cost or quality are quite beyond the purchaser's jurisdiction. Our metal, facing, binders, fuel, etc., are our own problems, but on the subject of pattern equipment we require his cooperation.

The true cost of producing castings in any foundry is the entire cost incident to their manufacture, and includes the expense of all pattern work. Some foundries may elect to absorb certain pattern charges, but when they do, these charges are probably included in the selling price. Castings produced from unsatisfactory equipment result in higher costs, again reflected in the selling price. We are pointing out these self-evident facts to show that the consumer pays for his pattern equipment, whether he gets it or not.

Many foundries include this pattern expense in their general operating costs, thereby inequitably spreading it over their entire output. This places an unwarranted burden on the customer furnishing satisfactory patterns, as he is helping to pay for another man's shortcomings. The more progressive foundries are placing this burden on the pattern which necessitates extra expense. It is hoped that all foundries will soon adopt equitable methods of cost distribution, for good business sense demands that each casting bear the entire burden of cost incident to its manufacture.

We cannot hope to swing to this principle overnight, the entire line of casting users. This will be accomplished only through the work of our intelligent sales representatives in presenting the facts in a convincing manner every time the question of pattern equipment arises. By their persistent efforts, we will gradually convince the buyer that it is for his interests as much as ours to give us the proper tools with which to work.

Editorials

Misfortune Dramatizes Industry

IMPRISONMENT of nearly six score Great Lakes freighters and their crews of two thousand men in the ice between the Soo and Lake Huron invests that branch of the iron and steel industry with a touch of the dramatic. Most people take their iron and steel, as they do the other basic items of daily existence, with scant thought of the realities. Within them a great bridge or a towering office building stimulates no thought of the human effort involved; it is one of life's utilities, to be accepted but not dwelt upon. But let come disaster or unusual achievement or marked stress of any sort and the response is immediate and universal.

Up and down the Great Lakes for eight months of the year these drab, slender, boxlike hulls ply their trade. Coal up, iron ore—occasionally grain—down, their turnaround measured in hours and minutes, they are almost aquatic automatons. They solicit no attention. Without their low cost per ton mile—the lowest, in fact, in marine transportation the world over—it is doubtful whether there would be any iron and steel industry in the lower lake region. In their shuttle movements is much to admire but little to inspire.

Now the elements paint a picture. Sixty million dollars worth of shipping gripped by icy fingers arising in some cases from the very bottoms of the channels; fuel and food running low; zero temperatures adding to the discomfiture of the crews, a sparsely-settled, snowbound country hemming in the channels; desperate efforts to break through the ice and open lanes to safety. To the humans involved it is all in the day's work, but to the world the industry is dramatized. This business of feeding the maw of glowing blast furnaces takes on life. The making of iron and steel is animate, after all.

Not including losses due to disturbed trade conditions, contracts not obtained and similar items, it is estimated that the seven-month British coal strike has cost Britain a billion and half dollars. This is one more argument for avoiding a stoppage in this country next April 1.

Joliet Proves It Can Be Done

GOVERNMENT officials in seeking to broaden accident prevention work among industrial groups are wont to point to the iron and steel industry as exemplary in this humanitarian work. The industry is cited as a leader in the foiling of hazards to life and limb. Many instances of the mastering of accident dangers pass almost without notice, so commonplace have they become. Typical is the attainment of a perfect twelve-month by the Joliet, Ill., works of the Illinois Steel Co. in its bessemer department. The first week in November marked the end of a year without any lost-time accident in this department. Previously this same department had operated through a period of 244 consecutive days without similar mishap. Such results bespeak a leadership that would make for success of the accident-prevention movement anywhere. The results obtained indicate what can be accomplished when everyone in a department functions every day for a mark.

All can agree with Henry Ford when he says: "We have reached the point in this country where we should know enough concerning intelligent control and direction of economic conditions to prevent the occurence of so-called hard times. If people would stop talking about good and bad business and concentrate on normal business, many of the evils would vanish."

Economics Will Be the Judge

SINCE the war it has been increasingly evident that a shorter work week would become one of the major problems confronting industry. At various times the United Mine Workers have proposed a six-hour five-day week but have not pressed it, being content to throw out the suggestion and concentrate at the time on wage rates. Henry Ford's adoption of the eight-hour five-day week has given the matter fresh impetus. The American Federation of Labor has adopted the five-day week as a goal. Now the National Association of Building Trades Employers has called a conference at Pittsburgh, Dec. 13, to discuss the front that is to be put up to demands for a five-day week. It is probable that the mine workers in submitting an agreement for the coal year beginning April 1 will ask for a short week.

As was to be expected, a sharp division of opinion has arisen among employers. Some denounce the short week as a national peril. Others pronounce it a necessity in order to absorb the present large output of commodities. It is a fact that throughout industrial history the tendency constantly has been toward less onerous condi-

tions of labor. At the same time individual productivity, generally speaking, has been increasing. To what extent this is due to accelerated personal effort or to improved methods and equipment provided by capital is not subject to exact determination. In the end the economics of the situation expressed in costs and productivity will decide the case.

Ore Output Valued at $250,000,000

NOW that the Lake Superior iron ore industry has completed its shipping season for 1926 with 60,000,000 tons to its credit, what are the net results? The market value of the product at lower lake ports and all-rail destinations was $250,000,000. This figure is close to the actual selling price. Open market quotations in recent years have been so close to production costs, and in some instances under such costs, that long-term contracts do not offer much deviation.

The railroads carrying the ore from mines to dock, and from mines to all-rail destinations, and the vessel companies transporting the ore from upper lake docks to lower lake ports collectively obtained the sum of $100,000,000, or about 40 per cent of the value of the ore at lower lake ports and all-rail receiving points. These figures are based on an average rail and vessel freight cost of $1.67 from mines to lower lake ports, and an average of $1.50 for all-rail shipments.

Approximately 40 cents of every dollar spent by the purchaser for ore at lower lake ports goes to the carriers, of which the upper lake railroads obtain by far the greater proportion, length of haul considered.

Extension of trade through installment sales undoubtedly has its perils, but the effect is not cumulative; while new obligations are being incurred old ones are being discharged. It is estimated that installment sales this year will exceed seven billion dollars. The temptation to push sales by extension of credit may be gaged from the fact for one person having the cash for a $1000 purchase, 550 can make a down payment of $200.

To Draft All But Incentive

MUCH has been said recently concerning the proposal to draft all of the nation's resources for the conduct of the next war. Unfortunately the primary inference is that capital is to be conscripted. The basic fact underlying the entire preparedness program of the war department is that labor, materials, property assets, transportation, shipping, capital—all of the resources of the country are to be applied to the one task of pursuing to a conclusion the task undertaken. The government is expected to have power to conscript anybody or anything. Paramount so far as industry is concerned is the importance of full productive ability. In order to assure maximum production in a time of national distress some profit must accrue to those participating in it. Neither workman nor industry can be stimulated to magnify their output with all profit eliminated.

What Our Readers Are Thinking

Suggests Seismograph for Deep Mines

THE mining operators in the Lake Superior district must realize that we are up against a new condition. The new condition should prompt the installation of delicate seismographic instruments to detect earth motions early enough to head off, by preventive measures, a recurrence of fatalities. I am convinced that it can be done with the use of improved scientific appliances

"The expense involved need not be prohibitive. New surveys will have to be made in every mine with reference to safety. Heretofore, the mining inspectors have depended on visual or auricular evidences to warn of danger. The new safety installation must be in advance of seeing and hearing.

Many of the iron and copper mines are deep—some of them a mile deep. The scientific men are dreading something of the kind that happened at Ishpeming in the deep gold mines in the British Transvaal. It is a fact rather widely accepted that it was an earthquake that tore Madagascar off from Africa and destroyed King Solomon's famous gold mines. Japan, through volcanic action, is rather rapidly going into the sea, making the solution of what sometimes is called "the yellow peril" entirely within the domain of the operation of seismic natural laws.

Generally speaking, iron mining is safe. Coal mining, by and large, is much more dangerous than iron mining. In the last three months more men have been killed in iron mining in Michigan than were killed in the pervious 75 years.

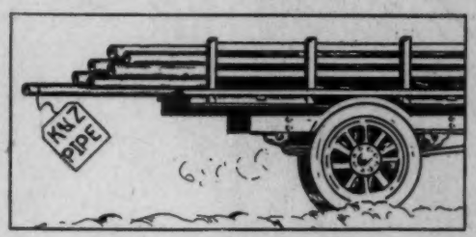
The cause undoubtedly lies in the effect of the recent earthquake on the junction points of the rock foundations. If the rock foundation is stilted, the disturbance is greater. Where shafts are 3000 feet deep, the rock foundations are badly twisted, folded and tilted, so that the effect of an earthquake is very great. The United States Steel Corp. and Cleveland Cliffs Iron Co. employ the best engineering talent obtainable. Their motto is "safety first—economy second." I am confident that the great mining interests, especially in the area affected by the recent earthquake will equip their deep mines with seismographic instruments which will detect earthquakes in time.—CHASE S. OSBORN, *former governor of Michigan, and member of the American Institute of Mining and Metallurgical Engineers, at National Republican club, New York, Nov. 5.*

The Readers' Page

Vol. LXXIX, No. 24 IRON TRADE REVIEW Dec. 9, 1926

Launching a Leviathan Among Business Publications

IRON TRADE REVIEW'S Annual will be published Jan. 6, 1927. The Annual, a Leviathan that will carry a capacity cargo of information, now is building. The designer, the engineers, superintendents, foremen and all hands are working overtime to produce a craft that will outrank all others and that will get away on time with colors flying. Speaking of colors, you must have noticed in past issues of the Annual the wealth of color used in the display advertising. An editorial man dislikes to admit super-elegance in advertising, but it is a fact that modern industrial advertising rightly done is running the editorial pages a severe race for sheer attractiveness and holding power. As you look through the advertising pages of the Annual you cannot fail to be impressed by the skill of the best advertisers, and by their interesting messages.



A suggestion for identifying your product. See page 1494

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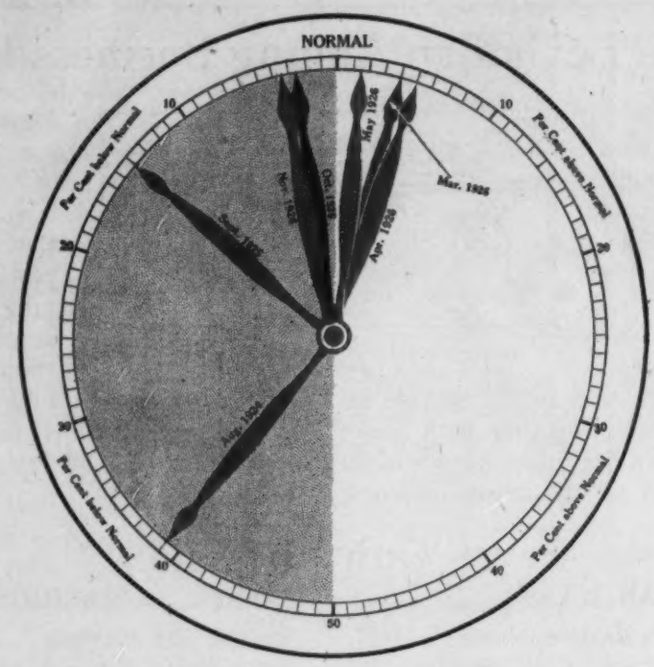
The Business Trend

Blast Furnace

The Dial represents the Blast Furnace Index of Business which is based upon a 40-year record of furnace activity. It is a barometer of general trade.



Business Dial

When 60 per cent of all the country's furnaces are in blast business conditions are normal. The Index is now lower than the normal point on the dial.

Small Recession Reflected

By JOHN W. HILL, Financial Editor

NOVEMBER brought a small decline in general industrial activities as measured by the Blast Furnace Business Dial. There was a net loss of two furnaces from the active list during the month. This made 216 furnaces in blast at the close of the month compared with the total number of available furnaces of 374.

ON NOV. 30, therefore, 57.7 per cent of the country's furnaces were active. Since 60 per cent is the computed normal, the Business Dial at the end of the month pointed to more than 3 per cent below normal. On this basis no important cessation of general activities is revealed.

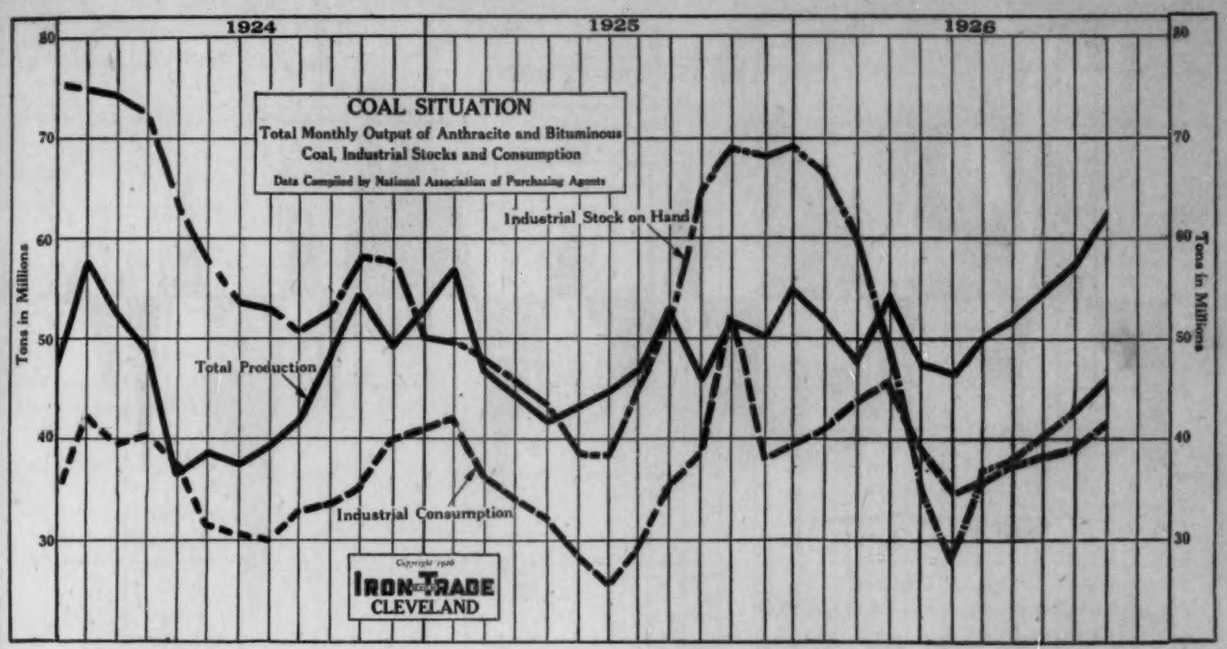
IN FACT there has been no widespread drop for industry. The automobile trade perhaps has witnessed the severest reduction in operation, but this in large measure is seasonal. As spring approaches, and sales normally expand the production of motor cars gradually should pick up. This recovery may be somewhat retarded for a time early in the year by the existence of heavier stocks of finished cars than usual in the hands of dealers.

ONE of the important factors in the outlook is the prospect for building. Construction has provided one of the most profound economic surprises of the year and it continues to do so. Preliminary figures from the F. W. Dodge Corp. indicate a gain in the value of building contracts in 37 states for November of more than 2½ per cent over November, 1925.

TENTATIVE estimates from the same source indicate an aggregate of contract awards in 1926 of $6,642,026,000. That would exceed the total for 1925 by $200,000,000. The continuance of large volumes of contract awards is of immediate forecasting significance.

CONTRACT awards now on hand mean continued building activity for from four to six months or more. Consequently it now seems certain that there will be no severe shrinkage in building activities during the first half of next year. This will be a supporting factor for general business and must not be overlooked in any attempt to appraise the future.

The Business Trend

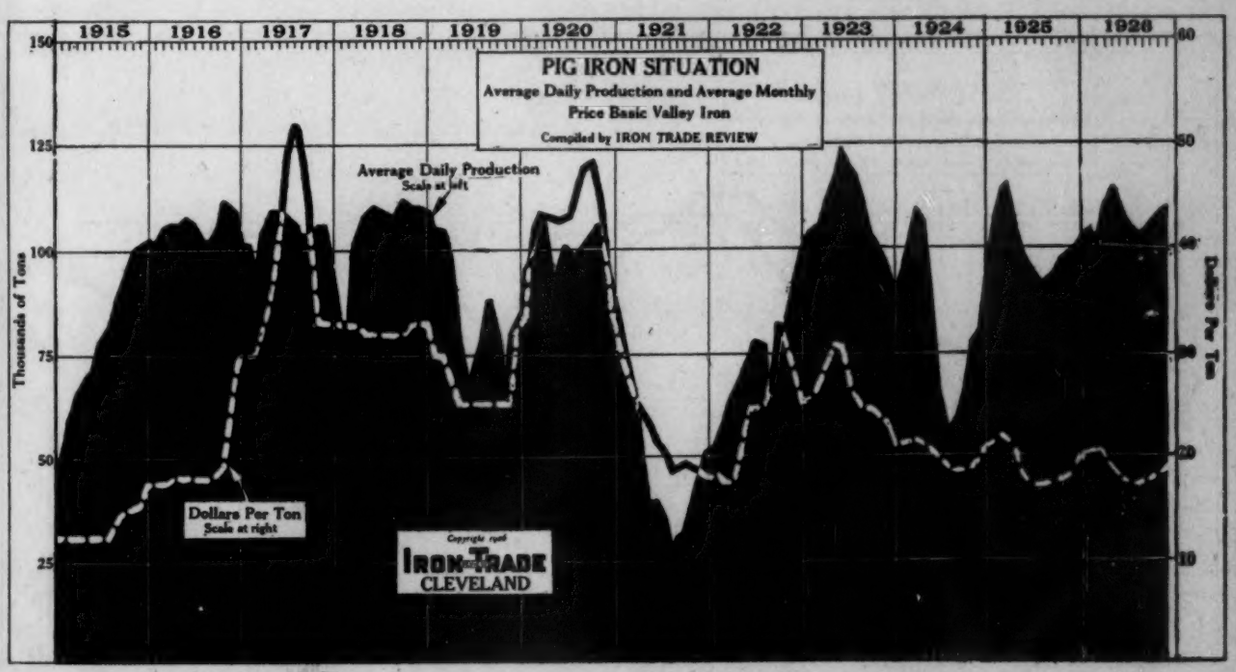


Coal Situation

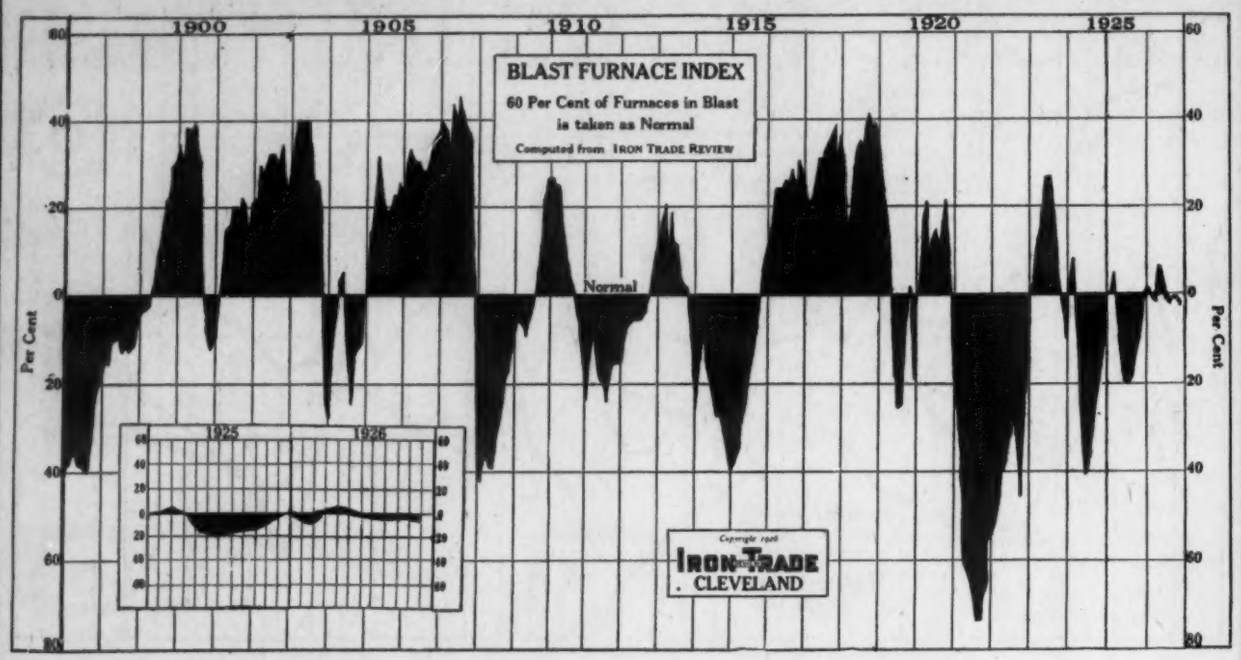
THIS autumn has witnessed a tremendous bulge in the production of coal. This has been due largely to the effect of the British coal strike, which is now passed. However American mine operations continue to speed ahead to unparalleled peaks. Consumption is rising also, according to the estimates of the National Association of Purchasing Agents. Stocks on hand also are rising and on Nov. 1 they amounted to 45,535,000 tons compared with 33,918,000 tons six months before.

Pig Iron Situation

TOTAL output and the daily rate of production of pig iron during November were the highest for any November since the war year of 1918. The daily rate of output was the highest for any month since last May. The average daily production was 107,898 tons, compared with 107,555 tons in October and 100,775 tons in November, 1925. During 11 months of the year 36,010,714 tons of pig iron have been produced, compared with 36,370,404 tons for all of 1925. Pig iron prices have been weakening.



The Business Trend

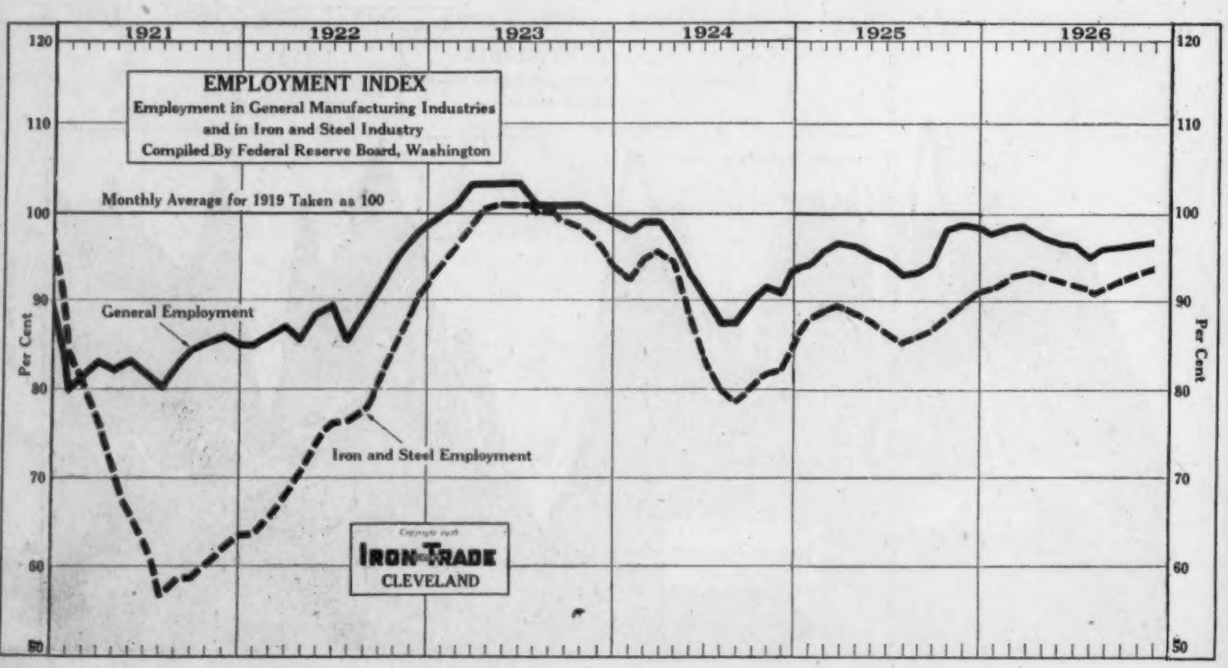


Blast Furnace Index

NOVEMBER brought a small reduction in the number of blast furnaces in blast. At the close of the month 216 furnaces were active, compared with 218 one month before. The month also brought an increase of one in the total number of serviceable blast furnaces, making the number 374, against 373. At the end of November 57.7 per cent of the available furnaces were in blast. This was 3.7 per cent below normal, against 2.5 per cent below normal one month before.

Employment Index

STATISTICS of industrial employment continue to disclose high levels. Employment in general manufacturing industries during October, as computed by the Federal Reserve Board, stood at 96.3 per cent of the 1919 average, compared with 95.8 per cent in September. Employment in the iron and steel industry also gained. It was 93 per cent of the 1919 average in October, against 92.7 per cent of the 1919 average in September. Employment in iron and steel plants is considerably higher than it was one year ago.



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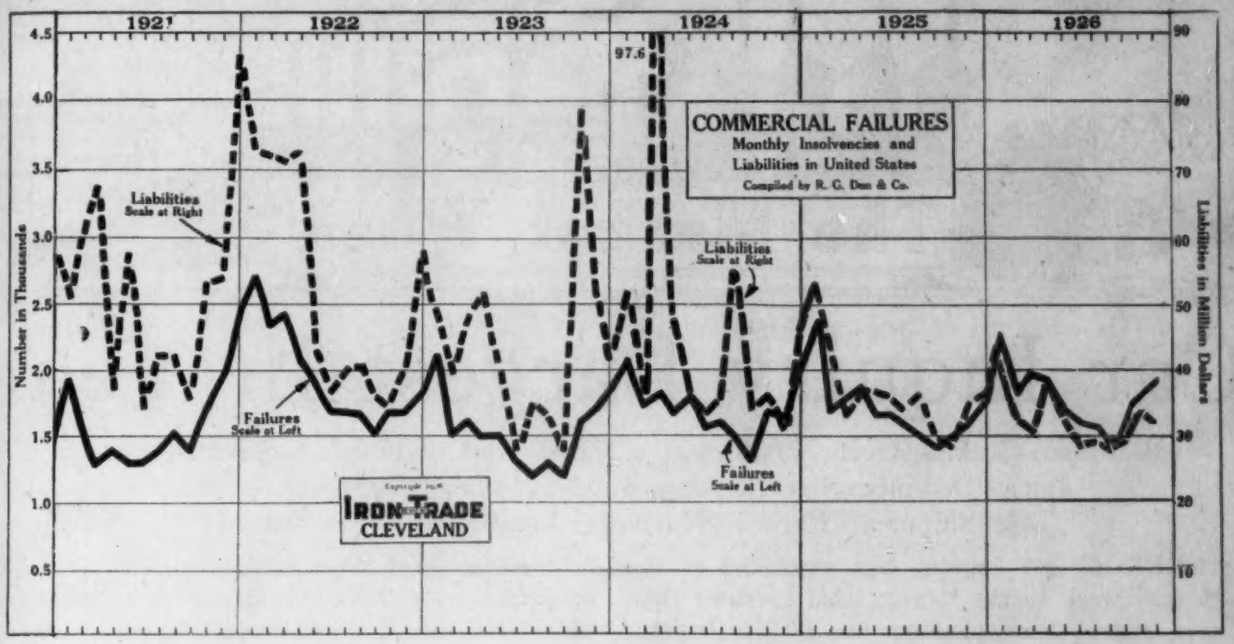
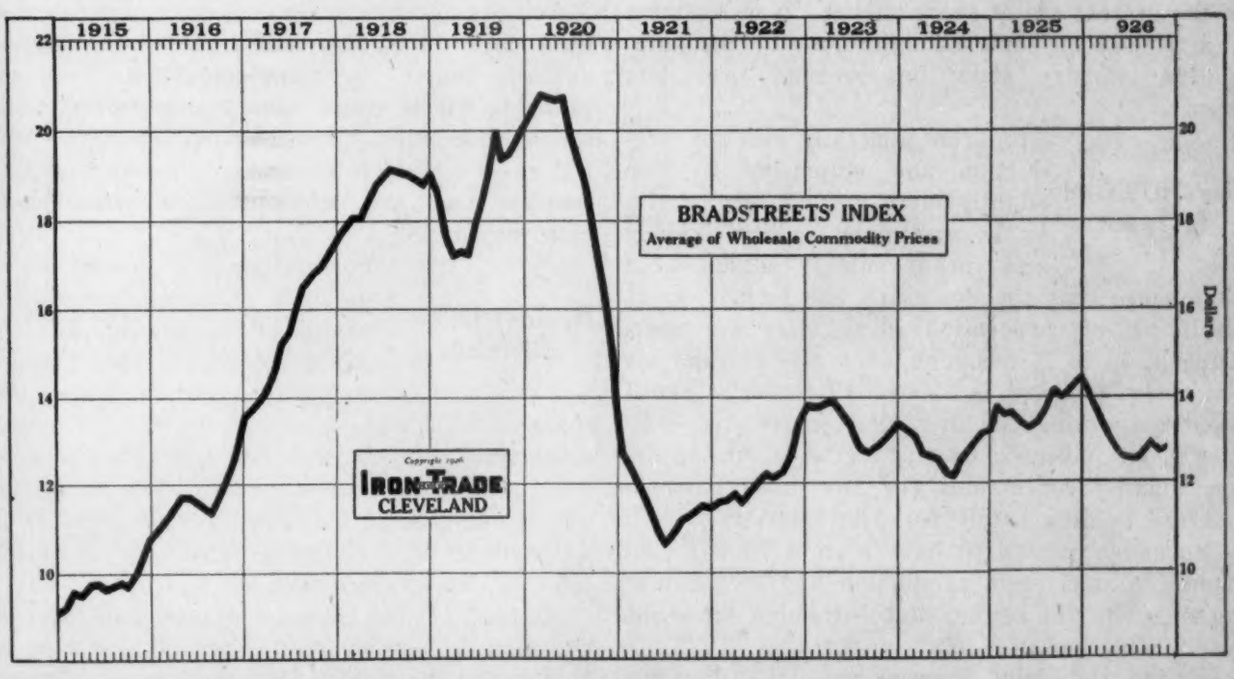


Business Failures

NOVEMBER usually brings an increase in the number of commercial failures in the United States. Last month was no exception. The number of insolvencies totaled 1830 compared with 1763 in October. In November, defaults were 9.4 per cent in excess of those for November, 1925. The total is the highest for any November since 1921. Liabilities amounted to $32,694,000, showing a decline from the total for October and also from that of November one year before.

Bradstreet's Index

WHOLESALE commodity prices, as measured by Bradstreet's Index number for Dec. 1 marked a small fraction of 1 per cent gain over the Nov. 1 number. This contrasted with a slight fractional decline in the preceding month. The movement of prices in the last five months has been trifling. Compared with one year ago Bradstreet's index now shows a decline fo 11.2 per cent. It is 20.4 per cent over the low point reached in June, 1921 and 38.7 below that of February, 1920.



Car Inquiry Largest In Year

Railroads Seeking Over 21,000, with 220,000 Tons of Finished Steel Needed—
Initial December Steel Bookings Top November—Sheet and Tin Plate
Shipments Record—November Ingot Rate 79 Per Cent

FREIGHT car inquiry has expanded in the past week to the largest total in more than a year. Now pending are 20,900 freight. 116 passenger and 125 miscellaneous cars, requiring probably 220,000 tons of finished steel and 100,000 tons of miscellaneous iron and steel products. Heightened activity also is manifest in track fastenings, the New York Central railroad placing about 25,000 tons, the Pennsylvania opening bids on 15,000 tons and a total of 35,000 tons being pending at Chicago.

This activity confronting the carbuilding industry rounds out a good week in finished steel. The daily rate of bookings thus far in December has exceeded the average for November, albeit the bulk will be for delivery in the first quarter. Contracting for first quarter delivery is encountering no more resistance than could be expected in the present era of short buying. New business and releases on contract obligations by the automotive industry show improvement over last month.

Says Decline Is Spent

Producers generally look for production and shipments to lose slightly more ground this month, as is customary in the holiday and pre-inventory season, but they sense that the downturn has largely spent itself. Steel corporation subsidiaries are operating at 74 to 75 per cent, while the average for the entire industry is about 70 per cent. Sentiment concerning the first quarter remains optimistic, as evidenced by the fact some producers are making concessions for December business but are holding firmly for first quarter.

November proves to have been a 79 per cent month in steel ingot production and in point of tonnage was the second best November since the war. The month's total output was 3,722,119 tons and the daily average rate 143,158 tons, or a recession of 9 per cent from October. This compares with 3,909,900 tons and a daily rate of 156,116 tons for last November. It is almost 20 per cent greater than in November, 1923.

Shipments At High Point

In both sheet and tin plate, new high records for shipments seem assured for 1926. With an outlook for 40,000,000 base boxes, tin plate promises to top all previous records by about 10 per cent. Shipments of sheets may pass 5,000,000 tons and thereby go ahead of 1925 by 12 to 14 per cent. At the moment, sheets are in an unstable market, with an increasing volume of business going at 3.00c, Pittsburgh, for black, 2.30c for blue annealed and 3.85c for galvanized. The leading maker of tin plate continues to operate at capacity while independent interests are at 85 to 90 per cent.

Activity in semifinished steel is circumscribed by a lack of inquiry and limited specifications against fourth quarter contracts. Producers probably will be called upon to carry over considerable December tonnage into January. Wire rod users who have covered for the first quarter indicate they are equalling their commitments of a year ago.

Beehive Coke Drifting

Connellsville coke continues to drag, with a further reduction of 25 cents in furnace and 50 cents in foundry coke. Spot sales of the .furnace grade have been made at $3.75 and of foundry at $4. By-product coke producers in practically all districts are booking first quarter business of large proportions and in the eastern districts have advanced prices 50 cents to $1. The spot market on by-product coke at Chicago has been marked up 50 cents.

Melters of pig iron generally still are discounting a possible tight fuel situation in the spring and the market lacks action. Steelmaking

grades of iron have been reduced 50 cents at Pittsburgh, to $19, valley, while bessemer iron is off $1 and is now held at $20, valley.

The inquiry for nearly 22,000 freight and passenger cars includes 4000 for the Illinois Central, 3290 for the Missouri Pacific, 3008 for the Santa Fe, 2500 for the Rock Island, 2000 for the Norfolk & Western, 2000 for the Baltimore & Ohio and 1500 for the St. Paul.

Due to weakness in both the pig iron and the sheet markets, IRON TRADE REVIEW composite of fourteen leading iron and steel products this week is $38.24 compared with $38.46 last week and an average of $38.43 for November.

Prices, Present and Past

Representative Market Figures for This Week, Last Month, Three Months and One Year Ago

	Dec. 8, 1926	Nov. 1926	Sept. 1926	Dec. 1925
PIG IRON				
Bessemer, valley, del., Pittsburgh	$21.76	22.01	19.96	22.76
Basic, valley	19.00	18.75	17.30	20.00
Basic, eastern del., eastern Pa.	22.75	22.50	20.76	23.00
*No. 2 foundry, del., Pittsburgh	20.76	21.36	19.46	22.26
No. 2 foundry, Chicago	21.00	21.00	21.00	25.00
*Southern No. 2, Birmingham	20.00	20.00	20.80	21.60
*Southern Ohio, No. 2 Ironton	20.00	20.00	20.00	21.10
**No. 2X, Virginia furnace	23.00	22.75	23.00	23.30
**No. 2, eastern del., Phila.	23.76	23.51	22.26	24.26
Malleable, valley	20.00	19.75	17.70	20.50
Malleable, Chicago	21.00	21.00	21.00	23.00
Lake Superior charcoal, Chicago	27.04	27.04	29.04	29.04
Gray forge, val., del., Pittsburgh	21.26	21.01	19.11	21.76
Ferromanganese, del., Pittsburgh	104.79	104.79	92.79	119.79
*1.75 to 2.25 silicon. **2.25 to 2.75 silicon.				
COKE				
Connellsville, furnace, ovens	3.75	4.75	3.25	4.00
Connellsville, foundry, ovens	4.50	5.85	4.50	5.10
SEMIFINISHED MATERIAL				
Sheet bars, open-hearth, Youngstown	36.00	36.00	36.00	36.60
Sheet bars, open-hearth, Pittsburgh	36.00	36.00	36.00	36.60
Billets, open-hearth, Pittsburgh	35.00	35.00	35.00	35.20
Wire rods, Pittsburgh	45.00	45.00	45.00	45.40
FINISHED MATERIAL				
Steel bars, Pittsburgh	2.00	2.00	2.00	2.00
Steel bars, Chicago	2.10	2.10	2.10	2.10
Steel bars, Philadelphia	2.32	2.32	2.27	2.32
Iron bars, Philadelphia	2.27	2.22	2.22	2.22
Iron bars, Chicago, mill	2.00	2.00	2.00	2.00
Beams, Pittsburgh	2.00	2.00	2.00	1.95
Beams, Philadelphia	2.22	2.22	2.22	2.17
Beams, Chicago	2.10	2.10	2.10	2.10
Tank plates, Pittsburgh	1.90	1.90	1.90	1.90
Tank plates, Philadelphia	2.22	2.22	2.22	2.07
Tank plates, Chicago	2.10	2.10	2.10	2.10
Sheets, black, No. 24, Pittsburgh	3.00	3.10	3.05	3.35†
Sheets, blue anl., No. 10, Pittsburgh	2.30	2.40	2.30	2.50
Sheets, galvanized, No. 24, Pittsburgh	3.95	3.95	3.95	4.60†
Sheets, black, No. 24, Chicago	3.20	3.25	3.15	3.50†
Sheets, blue anl., No. 10, Chicago	2.50	2.55	2.45	2.65
Sheets, galvanized, No. 24, Chicago	4.05	4.10	4.00	4.75†
Wire nails, Pittsburgh	2.65	2.65	2.65	2.65
Wire nails, Chicago	2.70	2.70	2.70	2.70
Tin plate per base box, Pittsburgh	$5.50	5.50	5.50	5.50
†Based on No. 28 gage.				
OLD MATERIAL				
Heavy melting steel, Pittsburgh	17.00	17.00	17.75	19.00
Heavy melting steel, eastern Pa.	15.75	15.95	16.85	17.65
Heavy melting steel, Chicago	13.00	13.00	14.10	15.50
No. 1 wrought, eastern Pa.	16.00	17.00	17.00	18.75
No. 1 wrought, Chicago	13.75	14.10	14.55	15.40
Rails for rolling, Chicago	16.50	16.50	17.25	18.55

Composite Market Average

The Fourteen Leading Iron and Steel Products Included are Pig Iron, Billets, Slabs, Sheet Bars, Wire Rods, Steel Bars, Plates, Structural Shapes, Black, Galvanized and Blue Annealed Sheets, Tin Plate, Wire Nails and Black Pipe

This week (Dec. 8, 1926)	$38.24
Last week (Dec. 1, 1926)	38.46
One month ago (November, 1926)	38.43
Three months ago (September, 1926)	37.76
One year ago (December, 1925)	39.14
Ten years ago (December, 1916)	53.68
Thirteen years ago (December, 1913)	23.29

Late News Flashes

Valley Independents at 65 Per Cent

Youngstown, O., Dec. 7.—Steel production by independent mills this week has dropped to about 65 per cent, against 70 per cent last week.

Rail Mill Pace Accelerated Gradually

Chicago, Dec. 7.—While rail mill operations will not reach capacity before January they are gradually being stepped up. Steel ingot production continues at about 80 per cent.

Selecting Foundry Convention City

Chicago, Dec. 7.—Directors of the American Foundrymen's association are meeting here today to select the city for the 1927 spring convention and possibly the 1928 convention and exhibit. The latter may go to Philadelphia.

Fisher Denies Sheet Mill Rumor

Cleveland, Dec. 7.—Rumors emanating from Wall Street that the Fisher Body Corp. is negotiating for the purchase or control of an eastern Ohio sheet mill are denied by officials of the Fisher Body Ohio Co. and by a representative of the sheet producer said to be involved.

McDonald Strip Mill Is Completed

Youngstown, O., Dec. 7.—Carnegie Steel Co. started operation of a 12-inch strip mill at the McDonald works last week. This is the last of three mills building of which was authorized early in 1925. It gives the McDonald plant a well diversified modern bar, strip, hoop and band mill.

Rate Hearing Begins in February

New York Dec, 7.—A decision to review all iron and steel freight rates in official classification territory east of the Mississippi and north of the Ohio and Potomac rivers, was reached at a meeting here Saturday attended by representatives of shippers, carriers and representatives of the interstate commerce commission and several state commerce commissions. Hearings will probably open in Pittsburgh in February.

Bring in Three New Open Hearths

Birmingham, Ala., Dec. 7.—Three of the four new 140-ton open-hearth furnaces at the Fairfield works of the Tennessee Coal, Iron & Railroad Co. are in operation and the fourth will be making steel by Jan. 1. This works now has seven open-hearth furnaces producing. Need for more steel has been apparent in the Alabama field for some time. Belief is strong that plans will be announced for four more open-hearth furnaces for this works.

Current Rolled Steel Prices

PRICES, CENTS PER POUND, UNLESS OTHERWISE STATED

Semifinished Material

Prices per gross ton

BILLETS AND BLOOMS

4 x 4-inch base

Pittsburgh, open-hearth	$35.00
Pittsburgh, bessemer	35.00
Youngstown	35.00
Philadelphia	40.30
Chicago	35.00
Forging, Pittsburgh	40.00
Forging, Philadelphia	45.30

SHEET BARS

Pittsburgh	$36.00
Youngstown	36.00

SLABS

Pittsburgh	$35.00
Youngstown	35.00

WIRE RODS

Pittsburgh	45.00
Cleveland	45.00
Chicago	46.00

Standard extras, $5 for screw stock; $15 for acid wire rods. Carbon extras, $3 for 0.20 to 0.40; $5 for 0.41 to 0.55; $7.50 for 0.56 to 0.75; $10 over 0.75.

SKELP

Grooved skelp	1.90c
Universal skelp, Pittsburgh	1.90c
Sheared skelp, Pittsburgh	1.90c

Structural Shapes

Pittsburgh	2.00c
Philadelphia	2.17c to 2.32c
New York	2.19c to 2.34c
Chicago	2.10c
Cleveland	2.19c
Birmingham	2.15c to 2.25c

Steel Plates

Pittsburgh	1.90c
Philadelphia	2.22c
New York	2.24c
Chicago	2.10c
Cleveland	2.09c
Birmingham	2.05c to 2.15c

Iron and Steel Bars

Pittsburgh, soft steel	2.00c to 2.10c
Pittsburgh, cold finishing	2.15c
Pittsburgh, forging quality	2.15c
Philadelphia, soft steel	2.32c to 2.42c
New York, soft steel	2.34c to 2.44c
Chicago, soft steel	2.10c
*Cleveland, soft steel	2.00c to 2.19c
Birmingham, soft steel	2.15c to 2.25c
San Francisco, soft steel	2.60c
Pittsburgh, refined iron	3.00c to 4.50c
Pittsburgh, reinforcing billet	2.00c to 2.10c
Youngstown, reinf. billet, base	1.90c to 2.00c
Chicago, rail steel	1.90c to 2.00c
Mill, rail steel	1.80c
Philadelphia, common iron	2.22c to 2.32c
New York, common iron	2.24c to 2.34c
Chicago, common iron	2.00c

*The 2.00c price applies to a limited range of forms and sizes.

Hoops, Bands, Strips

Hoops, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh, 6 inches and under	2.50c
Bands, Pittsburgh over 6 in.	2.30c
Hot rolled strip steel, Pittsburgh, stamping quality, over 6 in.	2.30c
Hot rolled strip steel, Chicago	2.50c to 2.60c
Bands, Chicago, under 6 inches	2.60c
Bands, Chicago, 6 in. and over	2.50c
Cold rolled strip steel, hard coils, 1⅛ inches and wider by 0.100-inch and heavier, base, Pittsburgh	3.25c to 3.50c
Worcester Mass	3.90c
Chicago	3.80c to 4.05c

Cold Finished Steel

Cold finished steel bars, drawn, or rolled, Pittsburgh, Chicago carloads	2.40c
Less carload	2.50c to 2.65c
Steel shafting turned and polished Pittsburgh, Chicago	2.60c

Screw stock base Cleveland $1 higher than Pittsburgh and Chicago.

Hot Rolled Alloy Steel

Pittsburgh or Chicago

S. A. E. Series—

2300 (3½ per cent nickel	4.40c to 4.50c
2100 (Nickel chromium)	3.40c to 3.50c
6100 (Chrome vanadium)	4.25c to 4.30c
6100 (Chrome vanad. spring)	3.85c
9250 Silico-mang. spring)	3.25c

Rails, Track Material

Standard bessemer rails, mill	$43.00
Standard open-h'th rails, mill	43.00
Relaying rails, St. Louis	24.00 to 31.00
Relaying rails, Pittsburgh	23.00 to 25.00
Light rails, 25 to 45, mills	36.00
Angle bars, Chicago base	2.75c
Spikes, railroad, Pittsburgh	2.80c to 2.90c
Spikes, small railroad, 7-16-inch and smaller, Pitts	2.90c to 3.00c
Spikes, boat and barge, Pitts.	3.10c
Spikes, railroad, Chicago	2.90c
Track bolts, Pitts. standard	3.90c to 4.25c
Track bolts, Chicago	3.90c
Tie plates, Chicago, Pittsburgh	2.35c

Wire Products

To Jobbers in Carloads

Dealers 5 cents per 100 pounds extra

F.o.b. Cleveland and Pittsburgh base.

Wire nails	2.65c
Galvanized nails smaller than 1-inch	4.90c
Galv'd nails, 1-inch and over	4.65c
Plain wire	2.50c
Annealed wire	2.65c
Galvanized wire No. 9 gage	3.10c
Barbed wire, painted	3.10c
Barbed wire, galvanized	3.35c
Polished staples	3.10c
Galvanized staples	3.35c

Coated nails, 100 lb. kegs, subject to Sept. 1, 1926, extra card over wire nail base.

Woven wire fencing (retailers) 12½ gage, 26-in. high 7-in. bars and 12-in. stays, per 100 rods, f.o.b. Pitts	$20.03

Joliet, DeKalb and Waukegan, Ill., and Anderson, Ind., prices $1 per ton over Cleveland-Pittsburgh base on products made there; Duluth $2 higher, Worcester, Mass., and Fairfield, Ala., $3 higher.

Sheets

SHEET MILL BLACK

No. 24, Pittsburgh base	3.00c to 3.10c
No. 24, Philadelphia, delivered	3.32c to 3.42c
No. 24, Gary, Indiana Harbor	3.20c
No. 24, Chicago, delivered	3.25c

TIN MILL, BLACK

No. 28, Pittsburgh	3.25c
No. 28, Gary base	3.35c

GALVANIZED

No. 24, Pittsburgh, base	3.95c
No. 24, Philadelphia, delivered	4.17c to 4.27c
No. 24, Gary, Indiana Harbor	4.05c
No. 24, Chicago, delivered	4.10c

BLUE ANNEALED

No. 10, Pittsburgh, base	2.30c to 2.40c
No. 10, Philadelphia, delivered	2.62c to 2.72c
No. 10, Gary, Indiana Harbor	2.50c
No. 10, Chicago, delivered	2.55c

AUTOMOBILE SHEETS

No. 20, Pittsburgh, base	4.25c

Tin and Terne Plate

Prices per 100-pound box, Pittsburgh

*Tin plate, coke base	$5.50

Gary, Ind., base 10 cents higher.

Long ternes, No. 24, base	4.30

*This price is subject to quantity differentials established by individual regulations.

Iron and Steel Pipe

Base Discounts Pittsburgh and Lorain, O. to Jobbers in Carloads

	Black	Galv.
1 to 3-inch butt steel	62	50½
1 to 1½-inch, butt iron	30	13

Indiana Harbor, Ind., and Evanston, Ill., 2 points less. Chicago del. 2½ points less.

Boiler Tubes

Less Carload Discounts—Carloads 4 Points Additional—F.o.b. Pittsburgh Mills

Steel 3¼ to 3¾-inch	68½
Charcoal iron, 3¼ to 4½-inch	5
Seamless hot rolled 3¼ to 3½-inch	46 off

Further discounts of seven 5 per cents allowed for carloads and six 5 per cents for less-carload, on lap welded steel. On seamless hot rolled several more 5 per cents allowed.

Chain, Piling, Cut Nails

Chain, 1-in. proof coil, Pitts.	6.00c
Sheet piling base, Pittsburgh	2.25c to 2.30c
Cut nails, c. l., f.o.b. mills	2.80c

Cast Iron Water Pipe

Prices per net ton

Class B Pipe

Four-inch, Chicago	$51.20 to 52.20
Six-inch to 24-inch, Chicago	47.20 to 48.20
Over 24-inch, Chicago	45.20
Four-inch, Birmingham	43.00 to 44.00
Six-inch and over, Birming'm	39.00 to 40.00
Four-inch, New York	55.50 to 56.60
Six-inch and over, New York	51.50 to 52.60
Standard fittings, Bir. base	$110.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20; gas pipe fittings, $5 higher.

Class A pipe is $5 higher than Class B

Nuts and Bolts

F.o.b. basing points, Pittsburgh, Cleveland, Birmingham and Chicago.

Prices named are for l. c. l. lots. Carloads take an extra 5 per cent off on carriage, machine and plow bolts and lag screws.

*Hot pressed square tapped or blank	$4.00 off list
*Ditto, hexagon	$4.40 off list
*Cold punched square or hexagon blank	$4.10 off list
*Ditto tapped	$4.10 off list
Cold punched U. S. S. semifinished hexagon nuts ⅝-inch and larger	75, 10 and 5 off
Cold punched U. S. S. semifinished hexagon nuts 9/16-inch and smaller	80, 10 and 5 off
Cold finished S. A. E. semifinished ⅝-inch and larger	75, 10, 10 and 5 off
Cold finished S. A. E. semifinished 9/16-inch and smaller	80, 10, 10 and 5 off

Add 25 cents per cwt. on cold punched and hot pressed nuts.

CARRIAGE BOLTS

(⅝ x 6-inch, smaller and shorter)

Rolled thread	50, 10 and 10 off
Cut thread (all sizes)	50 and 10 off
Eagle carriage bolts (Eagle list)	65 and 10 off

MACHINE BOLTS

(⅝ x 4-inch, hot pressed nuts)

Rolled thread	60 and 10 off
Cut thread	50, 10 and 10 off

(All sizes cold punched nuts)

Cut thread	45 10 and 5 off
Lag screws	60, 10 and 10 off
Plow bolts Nos. 3 and 7 heads	50 and 10 off
All other standard heads	50 and 10 off plus 20 per cent
Tap bolts	30 off
Bolt ends with hot pressed nuts	50, 10 and 10 off
Bolt ends with cold punched nuts	45, 10 and 5 off
Blank bolts	50, 10 and 10 off
Rough stud bolts with nuts (250 pieces or more of a size)	40 and 10 off
Stove bolts, 80, 10 and 5 off in bulk. In packages, 80, 10 and 5 plus 2½ off.	
Tire bolts	60 and 5 off

SEMIFINISHED CASTELLATED AND SLOTTED NUTS

Per 1000 f.o.b. maker's plant, frt. allowed

	S.A.E. Castellated	U.S.S. Slotted
¼	$ 4.40	$ 4.40
5/16	5.15	5.15
⅜	6.20	6.60
7/16	7.90	9.00
½	10.10	10.50
9/16	13.80	14.20
⅝	17.00	17.30
¾	28.50	24.00
⅞	36.00	36.00
1	55.50	58.00
1¼	89.00	89.00
1½	126.00	131.00
1¾	183.50	183.50
1½	210.00	210.00

HEXAGON CAP SCREWS

Milled	80 and 10 off
Upset	80, 10 and 10 off

SQUARE HEAD SET SCREWS

Milled	80 and 5 off
Upset	80, 10 and 5 off

Rivets

Structural rivets, carloads, Pittsburgh and Cleveland	2.40c to 2.60c
Structural rivets, c.l., Chi	2.60c to 2.75c

**Rivets, 7/16-inch and smaller, Pittsburgh, Cleveland, 70, 10 and 5 to 70 and 10 off.

**Rivets, 7/16-inch and smaller, Chicago 70, 10 and 5 to 70 and 10 off

**Some makers quoting 70 off with freight allowed on 300 pounds or more.

Washers

Wrought c.l., Chicago dist	$6.40 to 6.50 off
Wrought c.l., Pitts. dist	6.75 to 6.50 off
Lock washers, f.o.b. factory	85 to 90 off

Pig Iron

Market Dull and Easier, Shipments Holding Up—Steelmaking Grades Are Reduced by Valley Furnaces

THE market for pig iron is quiet, accompanied by an easier price situation, while shipments on contracts show but little reduction and in the main are satisfactory to furnace interests. Leading producers say they do not expect much business to develop until after the inventory period. The feature of special note this week is a reduction of 50 cents in quotations on steelmaking grades by valley furnace interests, although there are no inquiries to afford a test, and no sales have been reported. Basic now is quoted generally at $19, valley, and bessemer at $20. Buffalo makers are understood to be shading $19, base, furnace on foundry grades, a lower price reported applying on a recent purchase of 10,000 tons by a radiator manufacturer.

PITTSBURGH, Dec. 7.—Steelmaking grades of pig iron have been reduced 50 cents, although inquiries are out to test the market and no sales have been made in the past week. Basic now is quoted $19, valley, and bessemer $20, valley. Malleable is available in large lots at $19. Small carload sales continue to be made by several sellers at $20, valley. Foundry iron is $19 to $20, base, valley. Consumers are specifying liberally against contracts, resulting in high shipping rates. Some inquiries received by middle interests are coming from distant points, southern Ohio and eastern Indiana included. An inquiry from the Cincinnati district involves 4000 to 5000 tons of northern foundry iron. Melters in this district are withholding first quarter inquiries.

Average prices of steelmaking pig iron advanced during November, according to figures compiled by W. P. Snyder & Co. Basic sales in November averaged $18.50 a ton compared with $18 in October, and $19.81 in November, 1925. Bessemer averaged $19.94 a ton, compared with $19 in October and $20.88 in November, 1925.

Boston, Dec. 7.—Pig iron sales in New England are mainly in small lots for prompt delivery. Prices are unchanged. Active Buffalo furnaces quote No. 2X iron (2.25 to 2.75 silicon) at $19, furnace, for delivery to New England. This means $23.91 delivered, Boston and Worcester, and somewhat lower delivered prices for points farther west. The Everett, Mass., furnace quotes No. 2X iron at $21.50 to $22, furnace. The relined stack at Port Henry is due to restart in a week or 10 days.

New York, Dec. 7.—The New York state barge canal system has ceased to be a factor in pig iron until spring. Several barges with iron for New York harbor points have been frozen in the canal. Sales in this district in the past week aggregated 1500 to 2000 tons. The largest buyer was Abendroth Bros., Port Chester, N. Y., who placed less than 1000 tons with a Buffalo producer. New inquiry is small. Prices are unchanged at $19, base, Buffalo, and $22.50, base, eastern Pennsylvania furnace, for foundry.

Buffalo, Dec. 7.—Pig iron inquiries total 3000 tons, with sales proportionately low. Some Buffalo makers say $19 has been shaded on large outside business. The Port Chester inquiry for 1000 tons has been placed leaving no large inquiry pending.

Pig Iron Prices

Prices per gross ton

Bessemer, valley	$20.00
Bessemer, Pittsburgh del.	21.76
Basic, valley	19.00
Basic, Pittsburgh del.	20.76
Basic, Buffalo	19.00 to 19.50
Basic, del., eastern Pa.	22.50 to 23.25
Malleable, valley	19.00 to 20.00
Malleable, del. Pittsburgh	20.76 to 21.76
Malleable, del.; Cleveland	20.50
Malleable, Chicago	21.00
Malleable, Buffalo	19.00 to 20.00
Malleable, del., eastern Pa.	23.75 to 24.00
No. 1X Eastern del., Phila.	24.26 to 24.76
No. 1X, Buffalo	20.50 to 21.00
No. 1 foundry, Chicago	21.50
No. 2 foundry, valley	19.00 to 20.00
No. 2 foundry, del. Pittsburgh	20.76 to 21.76
No. 2 foundry, Buffalo	19.00 to 20.00
No. 2 foundry, Everett, Mass.	21.50 to 22.50
No. 2 foundry, Chicago	21.00
No. 2 foundry, Granite City	21.00 to 21.50
No. 2 foundry, Ironton	20.00
No. 2 foundry del., Cleveland	20.50
No. 2 foundry, del., Phila.	23.26 to 23.76
No. 2 foundry, N. J., tidewater	22.28 to 24.76
No. 2X, eastern del., Phila.	23.76 to 24.26
No. 2X east N. J., tidewater	22.78 to 25.26
No. 2X, foundry, Buffalo	20.00 to 20.50
No. 2X, eastern del., Boston	25.15 to 25.65
No. 2X, Buffalo, del., Boston	23.91 to 24.41
Continental foundry f.o.b. Boston	21.50 to 22.50
No. 2 Alabama, Birmingham	20.00
No. 2 Alabama, del. Cincinnati	23.69
No. 2 Tenn., Birmingham base	20.50
No. 2 Tenn., del. Cincinnati	24.19
No. 2 Alabama, del. Philadelphia	26.01
No. 2 Alabama, del. Chicago	26.01
No. 2 Alabama, del Chicago (barge and rail)	25.18
No. 2 Alabama, del. Boston (rail and water)	26.81
No. 2 Alabama, del. Cleveland	26.01
No. 2 Alabama, del. St. Louis	24.42
No. 2X Virginia	23.00
No. 2X, Virginia, del. Phila.	28.17
No. 2X, Virginia, del. Jers. City	28.54
No. 2X, Virginia, del. Boston	28.92
Gray forge, eastern Pa.	22.50 to 23.25
Gray forge, val. del. Pitts.	21.26
Low phos., standard, valley	29.00
Low phos., standard, Phila.	25.76 to 28.29
Low phos., Lebanon	25.00
Charcoal, Birmingham	29.00 to 30.00
Charcoal, Superior, del. Chicago	27.04

Silvery iron Jackson county, Ohio furnace, 5 per cent $25.50; 6 per cent $26.50; 7 per cent $27.50; 8 per cent $28.50; 9 per cent $30.00; 10 per cent $32.00; 11 per cent $34.00; 12 per cent $36.00; 13 per cent $38.00; and 14 per cent $40.00.

Bessemer ferrosilicon, Jackson county, Ohio, furnace, 10 per cent $34.00; 11 per cent $36.00; 12 per cent $38.00; 13 per cent $40.00; 14 per cent $42.00; 15 per cent $45.00; 16 per cent $47.00; 17 per cent $49.50.

*Duty paid, delivered Philadelphia consumers. Prices are f.o.b. furnace except where stated otherwise.

Buffalo makers think a radiator company's purchase of about 10,000 tons was entered at a lower price than the nominal base.

Cleveland, Dec. 7.—Consumers' interest in the pig iron market is at the lowest point of the year, inquiries pending here from all sources totaling about 4000 tons. The week's sales in districts served by makers whose principal offices are in Cleveland aggregated 10,000 tons. Prices show little deviation from a week ago, except that Cleveland furnaces are offering at $19, base, furnace, for shipment outside of Cleveland, and $19 to $19.50 represents the general lake furnace price level. For delivery in Cleveland $20, base, furnace, is quoted but not tested. The Corrigan, McKinney Steel Co. is blowing out two of its four stacks in Cleveland, it is said to install some new equipment which will require two to three weeks.

Chicago, Dec. 7.—Car foundries have placed several orders for pig iron, including one for 1500 tons by a Chicago melter. Although several heavy tonnages have been closed within the past few days buying generally is in lots of 200 to 500 tons. The 2500 tons of high silicon iron for an Iowa melter has been closed, and it is understood part of this went to St. Louis. A radiator plant at Litchfield, Ill., has closed for inventory, but a few malleable foundries are preparing to start limited operations on automobile business. December shipments indicate a rate approximating the November shipments, and hold-up orders are lighter than expected. Output in the Chicago area in December will not exceed 100,000 tons. Some second quarter iron is being booked. The price is $21, Chicago furnace, for No. 2 foundry and malleable.

Cincinnati, Dec. 7.—While the pig iron market here is quiet, prices are firm. Sales generally involve carloads. Northern foundry coke is quoted $20, Ironton, with one producer asking $20.50 on prompt carlots. Alabama and Tennessee grades are firm at $20, Birmingham.

St. Louis, Dec. 7.—Pig iron transactions in this district dropped to 3300 tons in the past week, the largest lot being 1500 tons of basic booked by the St. Louis

(*Concluded on Page* 1523)

The Market Section

Coke

Connellsville Fuel Lower in Quiet Market—By-Product Advanced in East and Chicago

BEEHIVE coke prices have declined 25 to 50 cents, the furnace grade now quoted $3.75 to $4.50, and foundry fuel $4.50 to $5. While some furnace interests are asking prices for first half producers are not quoting beyond April 1, in doubt about the labor situation. By-product coke is up 50 cents to $1 in eastern districts and 50 cents at Chicago.

Pittsburgh, Dec. 7.—More inquiries have been issued for beehive furnace coke for first quarter, although no sales for future delivery are noted. Some furnaces are asking prices over the entire first half. Producers decline to quote beyond April 1 as labor difficulties may be encountered at that time at union coal mines. Several furnaces in the valley and a few in the East are inquiring for coke but all defer closing, looking for further recession in prices. Some producers now are quoting minimums of $4.25 and $4.50, with a wage clause, which means around $3.50 or $3.75 on the former basis of quoting. Buyers have much lower figures in mind. Spot transactions continue to bring $3.75 and occasionally distress lots are selling at lower figures. Foundry coke is much weaker, several inquiries are pending for first half, and a few for first quarter. Some quotations of $5.50 have been reduced to $5. Premium brands are higher, but $4.50 to $5.00 prevails on standard selected 72-hour fuel. Activity in the coal market has slackened and quotations are weaker except from companies having large backlogs on export and domestic contracts. Gas slack coal is selling at $1.85 to $2.00; mine run coal is around $2.25 and three-quarters lump is $2.50 to $2.75.

Production of coke in the Connellsville region for the week ended Nov. 27 was 142,360 tons, compared with 140,000 tons the preceding week, according to the *Connellsville Courier*.

Boston, Dec. 7.—The New England Coal & Coke Co. and the Providence Gas Co. have advanced their foundry coke contract price for December from $13, delivered, to $13.50, delivered. The spot price is not definite as there is relatively small tonnage available. Spot sales of beehive have been made at $14, delivered. Books have been opened for first half and tonnage entered is about equal to that of a year ago. The Providence company has closed its books for first half, completely filled.

New York, Dec. 7.—Heavy contracting covering foundry coke for the first half is a feature of the market. The two New England and the northern New Jersey by-product operators have renewed with their regular trades, the coke to be billed at the price prevailing at time of shipment. A large beehive operator has opened books on foundry coke for first half on the basis of $6.25, Latrobe, with a wage clause. There is little spot demand and the spot market is weak. Spot beehive foundry coke is quoted at $5 to $5.25, Connellsville, and spot furnace at $3.75 to $4. The two New England interests have advanced their price on by-product foundry coke by 50 cents, their December figure being $13.50, delivered at New England points.

Chicago, Dec. 7.—By-product foundry coke has been advanced 50 cents for spot delivery and remainder of fourth quarter. It now is quoted $10.25, ovens, equivalent to $10.75, delivered in the Chicago district. The price for first quarter has not been decided. The rate of shipping is declining.

Cincinnati, Dec. 7.—Approach of the inventory period, with possible price reductions, has slackened demand for coke. With the exception of by-product foundry, specifications have fallen off. Wise county foundry is quoted $6 ovens, but it is reported that a leading seller moved several tonnages recently at 50 cents under that price. New River foundry ranges from $7 to $9, ovens.

St. Louis, Dec. 7.—While demand for metallurgical coke is strong, the market is easier largely because of liberal offerings of eastern beehive fuel. A slight reduction in the melt at foundries has served to reduce the urgency of demand for deliveries from the local by-product ovens.

Birmingham, Ala., Dec. 7.—Coke contracts are being booked for first half, and while the entire make for that period has not been covered, indications point to steady operations of all by-product plants. The quotation is firm at $5.50 for the foundry grade, with $6 applying on spot.

Coke Prices

Beehive, Ovens

Prices per net ton

Connellsville furnace	$3.75 to 4.50
Connellsville foundry	4.50 to 5.00
New River foundry	7.00 to 9.00
New River furnace	6.00
Wise county furnace	5.50
Wise county foundry	6.00
Alabama foundry	5.00 to 6.00

By-Product

Foundry, Newark, N. J.; del.	10.59 to 11.77
Foundry, Chicago, ovens	10.25
Foundry, New England, del.	13.50
Foundry, St. Louis	10.50
Foundry, Granite City, Ill.	10.50
Foundry, Birmingham	5.50 to 6.00
Foundry Indianapolis, del.	10.25
Foundry, Ashland, Ky.	8.00
Foundry, Portsmouth, O.	8.00

Ferroalloys

Spot Spiegeleisen Lower—Ferromanganese Users Contracting

New York, Dec. 7.—Spiegeleisen has been reduced, sales of spot carloads of 19 to 21 per cent grade having been made at $37, furnace. The price had been $40 for a number of weeks as a result of high coke prices. No price has been set on spiegeleisen for next year, there having been no recent contracting involving deliveries beyond the end of this year. Comparatively little additional ferromanganese has been placed on the books for first half but a number of inquiries before the trade seem to be getting near the closing stage. The price continues firm at $100, duty paid, tidewater. There is a tendency among consumers to take in all the ferromanganese they can get on 1926 contracts.

Tungsten ore is strong but not much activity is reported in this country. In Europe prices have gone to the equivalent of $11.25 a short ton unit, duty paid, in this country, causing ferrotungsten to go to $1.05 and up. Other ferroalloys are unchanged.

Pittsburgh, Dec. 7.—A slight increase is noted in contracting for ferromanganese. Several consumers in the Middle West are closing for first half. While the majority of orders have come from small users, this activity is spreading to the medium-size consumers, and before the week is out the larger melters are expected to come in for protection. Nothing is being sold beyond July 1, 1927, and the price $100, seaboard base, appears uncontested. Contracts for 50 per cent ferrosilicon are practically all signed, at $85, delivered.

Chicago, Dec. 7.—Ferroalloys are quiet, but several first half contracts have been placed for ferromanganese at $100, seaboard.

Ferroalloy Prices

†Ferromanganese 78 to 82 per cent, tidewater	$100.00
Ferromanganese delivered Pittsburgh	104.79
Spiegeleisen 19 to 21 per cent domestic furnace	37.00
Ferrosilicon, 50 per cent freight allowed	85.00 to 87.50
Ferrotungsten standard, per pound contained	1.05
Ferrochrome, 60 to 70 chromium, 4 to 6 carbon, cents per pound contained, delivered	11.50
Ferrovanadium, 30 to 40 per cent per pound estimated, according to analysis	3.15 to 3.65
Ferro-carbon-titanium, car lots, producers plant, net ton	200.00
Ferrophosphorus, per ton, carload, 17 to 19 per cent, Rockdale, Tenn., basis (18 per cent material)	91.00
Ferrophosphorus, electrolytic, per ton, carload, 23 to 25 per cent, f.o.b. Anniston, Ala., (24 per cent materials)	122.50

†Duty paid.

Plates

Tonnage Holding Up Well With November Figures—Tank and Barge Demand Fair

WHILE there are fewer individual orders the tonnage of plates placed on mill books so far in December is larger than in the corresponding period of November, in the experience of some large interests. New inquiries pending include 3000 to 5000 tons for a refinery in the Panhandle, Tex., district, and 3000 tons for Pennzoil expansion plans.

PLATE PRICES, PAGE 1508

Pittsburgh, Dec. 7.—Large steel plate business is in prospect from car, tank and barge builders. Specifications are slow. The price of 1.90c applies on spot business and first quarter contracts. Several additional contracts have been written. Some elevated tank awards are noted. A new refinery for the Panhandle, Tex., field will involve a large plate tonnage. The Pennzoil Co. has announced an expansion program in stills and tanks. Manufacturers located on the Ohio river are figuring on additional barge equipment.

Boston, Dec. 7.—Plate inquiry is better. Steel tanks aggregating 3,500,000 gallons capacity will be built at West Auburn, Mass. The Beacon Oil Co. is in the market for large tanks at Hartford, Conn. The market is quiet. The price is unchanged at 1.90c, Pittsburgh, or 2.265c, delivered.

New York, Dec. 7.—At least 25 consumers in this territory have closed contracts covering their first quarter plate requirements. The price in all cases appears to have been 1.90c, base, Pittsburgh, equivalent to 2.24c, delivered, New York. There have been irregularities in several instances but they appear to have been of a special character. Eastern mills are operating at 40 to 50 per cent.

Philadelphia, Dec. 7.—Plate demand continues practically unchanged. Eastern mills are operating at from 40 to 50 per cent of capacity. Several more first-quarter contracts were closed during the past week. The market is firm at 1.90c, Pittsburgh. Several gas holders are before trade.

Cleveland, Dec. 7.—December to date has turned in more tonnage than the corresponding period of November. Individual orders have been fewer, however,. The situation whereby many lake freighters have been icebound is two-edged; it offers the possibility of heavier repairs and may detain at upper lake ports certain vessels on which repairs were to be made at Lake Erie ports. The price situation is weaker. While 1.90c, Pittsburgh, 2.09c, Cleveland, is generally quoted it is believed that attractive business would bring out a lower figure from a local mill.

Chicago, Dec. 7.—Specifications for plate tonnages recently booked by oil tank builders are coming in steadily. Oil tankage and gas holders pending comprise the 20,000 tons still on inquiry. Mills declare the price is firm at 2.10c, Chicago.

CONTRACTS PLACED

250 tons, miscellaneous elevated tanks, one in Maine, one at Cumberland, Md., an other at Fordyce, Ark., and a fourth at Lockhart, Ala., to Pittsburgh-Des Moines Steel Co.

200 tons, derrick hull for T. E. Smith & Sons, New Orleans, to American Bridge Co.

CONTRACTS PENDING

3000 to 5000 tons, estimated, 17 tanks, 13 stills, etc., for the Pennzoil Co.'s expansion program; bids about to be asked.

3000 to 5000 tons, estimated, new refinery with stills, agitators, condensers, etc., for the Panhandle, Tex. field; bids being asked.

2700 tons, 3/16-inch and ¼-inch steel plate, pipe line, Yakima, Wash.; bids in.

600 to 800 tons, for pressure tanks for health sanitarium at Cleveland; general contract to Melbourn Bros., Canton, O.

3000 tons pipe line, Yakima, Wash. Bids postponed to December 13. Original estimated at 6000 to 10,000 tons.

930 tons, three 80,000-barrel tanks for Associated Oil Co., San Francisco. Bids being taken.

Penalty on Indian Iron Due Shortly

Washington, Nov. 7.—Definite decision in the matter of a countervailing duty on pig iron from India is expected from the custom service within the next two weeks or so. If a satisfactory rate can be worked out it is believed such a duty will be placed.

The question of a bounty being paid on pig iron in India has been before the custom service for many months. After an investigation the custom service announced it would place a countervailing duty on Indian iron but it seemed impossible then to arrive at a fair rate and the order was rescinded. Subsequently the state department was asked for additional information.

Semifinished

Users of Wire Rods and Forging Billets Close for First Quarter

THE market is quiet, with few inquiries out, and specifications at low ebb. A considerable tonnage of sheet bars, billets and slabs will be carried over to January on makers' books. Some users have indicated they will increase specifications this month. Buyers of wire rod and forging billets are closing for first quarter. Prices are steady.

SEMIFINISHED STEEL PRICES, PAGE 1508

Youngstown, O., Dec. 7.—Some indications appear of more interest by consumers in the market for sheet bars, billets and slabs for first quarter. Makers so far have intimated they may ask unchanged prices of $36 for sheet bars and $35 for billets and slabs for that delivery. However, with likelihood of there being some carry-over into first quarter, it would not surprise makers if consumers would maintain their policy of month-to-month buying until the general steel markets become more clearly defined.

Cleveland, Dec. 7.—Some fairly good contracts for first quarter for sheet bars, billets and slabs have been booked by a producer here. The prices are said to be $36, Cleveland or Youngstown, for sheet bars, and $35 for standard billets and slabs. These prices also are quoted on spot shipments. A slight improvement is noted in specifications.

Philadelphia, Dec. 7.—Several contracts for wire rods have been renewed for first quarter at $45, base, Pittsburgh. Purchasing of billets continues hand-to-mouth, with no important sales noted. Practically all consumers have sufficient tonnage to cover requirements for this year.

Pittsburgh, Dec. 7.—Scarcity of inquiries and limited specifications describe the semifinished steel market here. Prospects for specifications are brightening, however. Some buyers have promised to take out November quotas on which they were exceedingly slow last month. In addition, they will also specify a portion of their December allotments. Producers expect to be called on to carry over considerable tonnage into January. In prices, $35 applies on large billets and slabs, and $36 on small billets and slabs and sheet bars. Wire rod customers are getting under cover for first quarter, and orders compare favorably with any quarter of this year. The price is $45. Some users of forging billets over-specified on this quarter's business, while others have fallen behind. The former are contracting for first quarter. The market is firm at $40. Skelp is inactive. No concessions under 1.90c have appeared.

Iron and Steel Scrap Prices

Corrected to Tuesday noon. Gross Tons Delivered to Consumer

Steel Works Scrap

HEAVY MELTING STEEL

Birmingham	13.00 to 13.50
Boston (dealers)	10.50 to 11.00
Buffalo, No. 1	17.00 to 17.25
Buffalo, No. 2	15.00 to 15.50
Chicago	13.00 to 13.50
Cincinnati (dealers)	12.50 to 13.00
Cleveland, No. 1	14.25 to 14.75
Cleveland, No. 2	13.50 to 14.00
Detroit	11.75 to 12.25
Eastern Pennsylvania	15.50 to 16.00
Bethlehem delivery	15.50 to 16.00
New York (dealers) (yard)	9.25 to 9.75
Pittsburgh No. 1	16.50 to 17.00
Pittsburgh No. 2	16.00 to 16.50
St. Louis	13.00 to 13.50
Valleys, No. 1	16.00 to 16.50

COMPRESSED SHEETS

Buffalo	15.25 to 15.75
Chicago	11.00 to 11.50
Cleveland	13.00 to 13.50
Detroit	11.00 to 11.75
Pittsburgh	15.50 to 16.00
Valleys	15.00 to 15.50

BUNDLED SHEETS

Buffalo	11.00 to 11.50
Cincinnati (dealers)	8.50 to 9.00
Cleveland	12.00 to 12.50
Eastern Pennsylvania	13.00 to 13.50
Pittsburgh	14.50 to 15.00
St. Louis	8.50 to 9.00

SHEET CLIPPINGS, LOOSE

Chicago	8.25 to 8.75
Cincinnati	6.00 to 6.50
Detroit	6.25 to 6.75
St. Louis	8.50 to 9.00

STEEL RAILS, SHORT

Birmingham	12.50 to 13.50
Buffalo	17.00 to 17.50
Chicago	16.75 to 17.00
Cincinnati (dealers)	17.00 to 17.50
Cleveland (over 6 ft.)	14.75 to 15.00
Detroit	13.00 to 14.00
St. Louis	16.00 to 16.50

STOVE PLATE

Birmingham	14.00 to 15.00
Boston (consumers)	13.00 to 13.50
Buffalo	14.50 to 15.00
Chicago (net)	14.00 to 14.50
Cincinnati (dealers) (net)	8.50 to 9.00
Cleveland	11.00 to 11.50
Detroit (net tons)	11.50 to 12.00
Eastern Pennsylvania	13.00
New York (dealers)	10.00 to 11.25
Pittsburgh	13.00 to 13.50
St. Louis	15.00 to 15.50

LOW PHOSPHORUS

Buffalo, billet and bloom crops	18.00 to 18.50
Cincinnati (dealers)	16.50 to 17.00
Eastern Pennsylvania	19.00 to 20.00
Pitts. billet and bloom crops	20.00 to 20.50
Cleveland, billet and bloom crops	18.00 to 18.50

SHOVELING STEEL

Chicago	13.00 to 13.25
Pittsburgh	12.50 to 13.00
St. Louis	13.00 to 13.50

KNUCKLES, COUPLERS, SPRINGS

Chicago	15.50 to 16.00
Eastern Pennsylvania	17.00 to 18.00
Pittsburgh	18.00 to 18.50
St. Louis	14.50 to 15.00

FROGS, SWITCHES, GUARDS

Chicago	15.00 to 15.50
Eastern Pennsylvania	12.00 to 12.50
St. Louis	14.00 to 14.50

ANGLE BARS—STEEL

Buffalo	15.25 to 15.75
Chicago	15.00 to 15.50
St. Louis	13.75 to 14.25

Iron Mill Scrap

RAILROAD WROUGHT

Birmingham	11.00 to 12.00
Boston (dealers)	12.00 to 12.50
Buffalo, No. 1	13.50 to 14.00
Buffalo, No. 2	15.00 to 15.50
Chicago, No. 1	13.75 to 14.00
Chicago, No. 2	13.00 to 13.50
Cincinnati, No. 1 (dealers)	11.50 to 12.00
Cleveland, No. 1	11.50 to 12.00
Eastern Pennsylvania	17.00 to 17.50
New York, No. 1 (dealers)	14.50 to 15.00
Pittsburgh, No. 1	13.00 to 13.50
Pittsburgh, No. 2	16.50 to 17.00
St. Louis, No. 1	12.50 to 13.00
St. Louis, No. 2	13.00 to 13.50

WROUGHT PIPE

Boston (dealers)	9.00 to 9.50
Eastern Pennsylvania	14.00 to 14.50
Buffalo	15.00 to 15.50
New York (dealers)	9.25 to 9.75

YARD WROUGHT

Boston	12.00 to 12.50
Eastern Pennsylvania	13.50 to 14.50

BUSHELING

Buffalo	15.25 to 15.75
Chicago, No. 1	11.50 to 12.00
Chicago, No. 2	8.50 to 9.00
Cincinnati, No. 1 (dealers)	8.00 to 8.50
Cleveland No. 1	11.75 to 12.00
Cleveland, No. 2	11.00 to 11.25
Pittsburgh, No. 1	14.50 to 15.00
St. Louis, No. 1	11.50 to 12.00

MACHINE SHOP TURNINGS

Birmingham	8.00 to 8.50
Boston	8.00 to 8.50
Buffalo	10.50 to 11.00
Chicago	7.25 to 7.75
Cincinnati (dealers)	6.00 to 6.50
Cleveland	9.00 to 9.25
Detroit	7.50 to 8.00
Eastern Pennsylvania	13.00 to 13.50
New York (dealers)	9.25 to 9.75
Pittsburgh	11.50 to 12.00
St. Louis	7.00 to 7.50

CAST IRON BORINGS

Birmingham (chemical)	15.50 to 16.00
Birmingham (plain)	8.00 to 8.50
Boston Chemical	10.00 to 10.50
Boston (dealers)	8.00 to 8.50
Buffalo	12.00 to 12.50
Chicago	9.50 to 10.00
Cincinnati (dealers)	6.00 to 6.50
Cleveland	11.00 to 11.50
Detroit	8.75 to 9.25
Eastern Pennsylvania	13.00 to 13.50
Eastern Pennsylvania (chem.)	15.50 to 16.00
New York (dealers)	9.25 to 9.75
Pittsburgh	12.50 to 13.00
St. Louis	10.50 to 11.00
Valleys	13.50

MIXED BORINGS AND TURNINGS

For blast furnace use

Boston (dealers)	8.00 to 8.50
Buffalo	12.00 to 12.50
Cincinnati (dealers)	5.50 to 6.00
Cleveland	11.75 to 12.00
Detroit	8.50 to 9.00
Eastern Pennsylvania	12.50 to 13.00
New York (dealers)	9.25 to 9.75
Pittsburgh	12.50 to 13.00

PIPES AND FLUES

Chicago (net)	8.25 to 8.75
Cincinnati (dealers)	7.50 to 8.00
St. Louis	10.00 to 10.50

RAILROAD GRATE BARS

Buffalo	13.00 to 13.50
Chicago (net)	13.25 to 13.75
Cleveland	12.00 to 12.50
Eastern Pennsylvania	13.00
New York (dealers)	11.25 to 12.00
St. Louis	14.50 to 15.00

FORGE FLASHINGS

Boston (dealers)	8.50 to 9.00
Buffalo	13.00 to 13.50
Chicago	9.25 to 9.75
Cleveland (over 10 in.)	11.50 to 12.00
Cleveland (under 10 in.)	11.50 to 12.00
Detroit	8.25 to 8.75
Pittsburgh	13.00 to 13.50

FORGE SCRAP

Boston (dealers)	8.50 to 9.00
Chicago	17.00 to 17.50
Eastern Pennsylvania	13.50 to 14.00

ARCH BARS AND TRANSOMS

Chicago (net)	19.00 to 19.25
St. Louis	20.00 to 20.50

Iron Steel Works Scrap

AXLE TURNINGS

Boston (dealers)	9.50 to 10.00
Buffalo	13.50 to 14.00
Chicago	12.00 to 12.50
Cleveland	12.50 to 13.00
Eastern Pennsylvania	14.00 to 14.50
Pittsburgh	15.00 to 15.50
St. Louis	10.50 to 11.00

STEEL CAR AXLES

Birmingham	16.00 to 17.00
Boston (shipping point)	18.00 to 18.50
Buffalo	16.50 to 17.00
Chicago	18.50 to 19.00
Cleveland	16.00 to 16.50
Eastern Pennsylvania	22.00 to 23.00
Pittsburgh	20.00 to 21.00
St. Louis	19.50 to 20.00

SHAFTING

Boston (shipping point)	16.00 to 17.00
Chicago	18.50 to 19.00
Eastern Pennsylvania	21.00 to 22.00
New York (dealers)	17.50 to 18.00
St. Louis	17.50 to 18.00

Iron Foundry Scrap

CAR WHEELS

Birmingham, iron	15.00 to 16.00
Boston (consumers)	17.00 to 17.50
Buffalo, iron	16.00 to 16.50
Buffalo, steel	17.00 to 17.50
Chicago, iron	14.75 to 15.25
Chicago, steel	16.50 to 17.00
Cincinnati	11.50 to 12.00
Eastern Pennsylvania	16.50 to 17.00
New York iron (dealers)	12.50 to 13.50
Pittsburgh, iron	16.00 to 16.50
Pittsburgh, steel	18.50 to 19.00
St. Louis, iron	14.00 to 14.50
St. Louis, steel	15.00 to 15.50

NO. 1 CAST SCRAP

Birmingham, cupola	16.00 to 17.00
Boston	18.00 to 18.50
Buffalo	15.25 to 15.75
Chicago, No. 1 machinery	18.50 to 19.00
Chicago, No. 1 railroad or agricultural	17.50 to 18.00
Cincinnati No. 1 machinery cupola (net tons dealers)	17.00 to 17.50
Cleveland, cupola	16.75 to 17.25
Detroit (net tons)	13.75 to 14.25
Eastern Pennsylvania, cupola	17.00 to 17.50
New York, cupola (dealers)	14.50 to 15.00
Pittsburgh, cupola	16.00 to 16.50
San Francisco, delivered	20.00 to 21.00
Seattle	16.50
St. Louis, railroad	16.50 to 17.00
St. Louis, agricultural	16.00 to 16.50
St. Louis, machinery	19.00 to 19.50
Valleys	17.50

HEAVY CAST

Boston	15.50 to 16.00
Buffalo (breakable)	13.25 to 13.75
Cleveland	13.00 to 13.25
Detroit (automobile) (net tons)	14.50 to 15.00
Eastern Pennsylvania	16.00 to 16.50
New York (dealers)	12.75 to 13.50
Pittsburgh	15.00 to 15.50

MALLEABLE

Boston, railroad	18.50 to 19.00
Buffalo	17.50 to 18.00
Chicago, agricultural	15.25 to 15.75
Chicago, railroad	16.00 to 16.50
Cincinnati, railroad (dealers)	14.00 to 14.50
Cincinnati, agricultural (dealers)	13.00 to 13.50
Cleveland, agricultural	15.50 to 16.00
Cleveland, railroad	17.00 to 17.50
Detroit	14.00 to 14.50
Eastern Pennsylvania, railroad	14.00 to 15.00
Pittsburgh, railroad	17.00 to 17.50
St. Louis, agricultural	13.00 to 13.50
St. Louis, railroad	14.00 to 14.50

Miscellaneous Scrap

RAILS FOR ROLLING

5 feet and over

Birmingham	14.00 to 15.00
Boston (dealers)	12.00 to 12.50
Buffalo	17.25 to 17.75
Chicago	16.50 to 17.00
Cleveland	14.50 to 15.00
Eastern Pennsylvania	17.00 to 17.50
New York	13.75 to 14.25
Pittsburgh district	18.00 to 19.00
St. Louis	15.25 to 15.75

LOCOMOTIVE TIRES

Chicago, No. 1	17.75 to 18.00
Chicago, cut	17.00 to 17.50
St. Louis, No. 1	16.25 to 16.75

LOW PHOSPHORUS PUNCHINGS

Chicago	15.50 to 16.00
Eastern Pennsylvania	17.50 to 18.50
Pittsburgh	18.00 to 19.00

Scrap

Further Weakness Shown in All Grades—Consumers Are in Control of Market

EVERYWHERE the consumer is in control of the situation in iron and steel scrap and dealers are concerned most in making deliveries on contracts. Some embargoes are in effect and resistance is encountered in selling and deliveries. Prices are weaker and gradually declining. Railroad lists brought less premium than formerly. Weakness is general.

Chicago, Dec. 7.—Heavy melting steel at $13 to $13.50 is weak in a market that is listless and controlled solely by consumers wants. Dealers are able to obtain melting steel with which to meet obligations at $13.25, and mills are declining to buy at $13.50, the price paid ten days ago by a mill in this district for a heavy tonnnage. Due to abundant stocks of steelworks and foundry grades of iron and steel scrap and easier operations during the inventory period, present quotations fail to interest consumers. Closing of the Burlington, New York Central, Pennsylvania and Baltimore & Ohio railroad lists failed to bring out fancy prices, such as were offered for previous lists. The price for melting steel was $13.60, tracks. Compressed sheet scrap is 50 cents weaker and is quoted at $11 to $11.50. No. 1 railroad wrought again is down 50 cents.

New York, Dec. 7.—Trading in the scrap market continues largely a matter of covering on back contracts. Dealers are in receipt of little new business from mills. A fair tonnage of yard steel was recently placed by the Eastern Steel Co., Pottsville, Pa., on which dealers were covering at $13, delivered, but the mill has now held up shipments. Dealers' buying prices in the main are unchanged, and while the tendency has been downward recent heavy snows have served at least temporarily to check this tendency. A small order of cast scrap for a northern New Jersey foundry has been closed at a concession under its previous purchase.

Buffalo, Dec. 7.—Heavy melting steel is fractionally lower as the result of lack of demand and desire of some dealers to move material before inventories. Previous offers of $15.50 for ordinary heavy melting steel have been accepted by some dealers and even lower figures are named as the basis of small lots sales. Unfilled orders are holding the market for this material, especially the selected grade.

Pittsburgh, Dec. 7.—Sellers of scrap are more concerned about obtaining releases on orders than about booking new business. Sales are small and in some instances under forced conditions, creating bargain prices. Heavy melting steel scrap now is quoted at $16.50 to $17, and compressed sheets at $1 less.

Cleveland, Dec. 7.—Except for some buying of blast furnace scrap, principally shovel turnings, no movement has taken place in iron and steel scrap. Quotations are largely nominal. Melters refuse to take interest in offerings and deliveries on contracts seem sufficient for their needs.

Philadelphia, Dec. 7.—Most scrap buying continues to be done by dealers to apply on contracts. Mills are showing some signs of interest. One mill has advanced its offer on grate bars 50 cents to $13.50. A few melters would buy heavy melting steel at $15.00 but apparently dealers are unwilling to sell at that figure.

Boston, Dec. 7.—Iron and steel scrap prices generally have declined and sales have been quieter except in a few specialties. Several cars of chemical borings have been purchased by a New Jersey consumer at approximately $10.75, shipping point.

St. Louis, Dec. 7.—Iron and steel scrap continues dull, with the trend of prices downward. Consummers are buying almost nothing, and with most of them striving to show small inventories about the end of the year, it is not likely that they will augment their stocks.

Detroit, Dec. 7.—Iron and steel scrap continues to show no improvement. Current demand is light and only small tonnages are moving. Dealers are maintaining their cautious buying policy.

Birmingham, Ala. Dec. 7.—Much old material is moving. Consumers, especially of heavy melting steel, asking delivery on contracts placed some time back. Market is quiet, otherwise, prices low and weak. Heavy melting steel holds at $13.

Sheets

Shipments Show Substantial Gain Over 1925—Market Easier, Especially Blue and Galvanized

NOVEMBER sheet shipments by the leading interest were the largest for any month in its history except May, 1916. The total of shipments by all makers for the year 1926 is likely to exceed those of 1925 by 12 to 14 per cent. There is a slight increase in orders for shipment after Jan. 1. Some mills are shading blue annealed and galvanized $1.50 to $2.

SHEET PRICES, PAGE 1508

Youngstown, O., Dec. 7.—A number of small orders for sheets for immediate shipment enabled two mills here that were down last week to resume in full Monday. One important maker reduced its operating rate, closing down all but eight mills. District sheet mills have been operating on an off-and-on schedule for two weeks, but by the end of the year they hope to resume more nearly normal schedules. Quotations on quick shipment black and galvanized show some indications of softness, some mills taking fill-in orders for black at 3.00c and galvanized at 3.85c. Quotations on full-finished are firm at 4.25c, and on all grades of sheets for delivery in the first quarter of the new year.

New York, Dec. 7.—The Imperial Government railways of Japan are taking bids on 1028 tons of copper-bearing sheets for building and repairing cars.

Philadelphia, Dec. 7.—With sheetmakers generally needing business and eastern mills reduced to 50 to 60 per cent operations the market is developing concessions more rapidly. A number of first quarter contracts were placed last week at 2.30c, Pittsburgh, for blue, 3.00c for black and 3.85c for galvanized. Even less seems to have been done in some cases, but these figures represent the ordinary minimums. Fully 60 per cent of current business is bringing 2.40c for blue, 3.10c for black and 3.95c for galvanized.

Cleveland, Dec. 7.—Sheet demand continues to slacken as the pre-inventory season is reached. Although many mills are nearing the point where week-to-week schedules again are essential, one maker with a district office in Cleveland reports the past two months has broken all records for 16 years. First quarter inquiries are few and contracting generally is postponed until after inventories. Black sheets are steady at 3.00c to 3.10c, with larger mills holding to the maximum. Blue annealed ranges from 2.30c to 2.40c, and galvanized from 3.85c to 3.95c. Autobody sheets are firm at 4.25c, Pittsburgh.

Chicago, Dec. 7.—Larger specifications for blue annealed sheets are helping to fill out rolling schedules. Mills report specifications heavier than a year ago, although spot buying is slow. Evidences appear that sheet users are seeking to augment their stocks. The leading independ-

ent producer points out that 75 per cent of its sales and specifications the past several days were for delivery early in January. Little buying for first quarter is noted. Indications are that the year's shipments will surpass substantially those of last year. Mill operations at Indiana Harbor will continue full until after the first of the year, except for a brief shutdown for repairs. Gary operations have been reduced.

St. Louis, Dec. 7.—Demand for sheet has slowed down mainly because of inventories. The leading local producer has reduced operations from 95 to 80 per cent. Prices show an easier trend. On a Gary basis black sheets are quoted at 3.20c; blue annealed 2.50c, and galvanized 4.05c.

Pittsburgh, Dec. 7.—New orders and specifications for sheets are increasing. Last week's record was slightly better than the week preceding particularly for full finished. While there is a decided tendency among buyers, particularly jobbers, to reduce inventories, the buying rate improves as consumers get ready for increased schedules in January. Some are endeavoring to have material shipped to them late in the month so it will arrive after Jan. 1. Several makers claim that blue annealed sheet business has been attractive, and galvanized orders continue at a high average. November shipments of galvanized sheet by the American Sheet & Tin Plate Co. were exceeded only by one month in its entire history, namely May, 1916. From present indications, shipments of all grades of sheets by all makers for 1926 will exceed last year's by 12 or 14 per cent. More price competition is evident, particularly on blue annealed and galvanized. Some small producers are quoting $1.50 or $2 less per ton than the figures quoted generally for first quarter. Black is not shaded so much, and full finished is firm at the quoted market 4.25c.

Boston, Dec. 7.—First quarter sheet contracts are fair. Current specifications are dull. Galvanized sheets are firm at 3.95c, Pittsburgh. Black sheets are less firm, but are quoted 3.10c, Pittsburgh.

Buffalo, Dec. 7.—Sheet business is greatly improved. First quarter specifications are coming out in increasing volume. Mills will quote 3.00c, Pittsburgh, on black tonnage for immediate acceptance only, and are said to be planning an early effort to establish a base price of 3.10c. The galvanized quotation is 3.95c. Mill operation is about 60 per cent.

Tin Plate

All Shipping Records Broken—Japan Places Large Orders

TIN PLATE PRICES, PAGE 1508

Pittsburgh, Dec. 7.—Tin plate business continues good, and shipments are heavy indicating that 1926 is the highest shipping year in all history by possibly 10 per cent. Since last Wednesday when its La Belle plant went on full, the American Sheet & Tin Plate Co. has been operating 100 per cent, which seldom is possible at this season of the year. Specifications are liberal, and 1927 promises to be a year of huge consumption. Independent producers are operating at 85 or 90 per cent on the average. The open market price continues unchanged at $5.50.

New York, Dec. 7.—The Nippon Oil Co. of Japan is understood to have doubled the quantity of tin plate it inquired for recently and to have distributed the order, aggregating 55,500 boxes, among three large Japanese merchant firms. It is believed the entire tonnage will be placed with American makers. The Kyoto Oil Co. of Japan is inquiring for 14,700 boxes of tin plate for early next year.

In 1864 the manufacture of bessemer steel was undertaken successfully in this country while the first open-hearth steel was made in 1868.

Urges Trade Bodies to Submit Plans

Washington, Dec. 7.—"The department has encouraged the submission to it of policies and plans adopted by the various trade associations," says Attorney General Sargent in his annual report to the President, in connection with trade associations. He says:

"To the associations which have submitted such statements the department has made clear that it can not and will not give a statement of approval or opinion as to legality. But in the case of associations which in the opinion of the department have endeavored to comply with the law, but whose methods appear to be of doubtful legality, the department has brought this fact to their attention."

Pipe

Miscellaneous Orders Keep Mills Operating Near Capacity—100,000-Ton Project Revived

MISCELLANEOUS orders for pipe continue in good volume, giving mills practically full operating schedules. The inquiry for a gas line from Texas to Denver has been revived with expectations of 100,000 to 125,000 tons of pipe to be placed early in 1927. Bids are being taken on 3100 tons of 8-inch pipe for Detroit. Jobbers report active demand. Prices are firm.

PIPE PRICES, PAGE 1508 AND 1542

Pittsburgh, Dec. 7.—Miscellaneous orders continue numerous for pipe of all kinds. Jobbers are turning over their stocks rapidly for this season in standard full weight merchant pipe, and oil country jobbers are active due to widespread drilling programs now under way by various oil interests. Operations among pipe mills still are practically full, particularly on lap-welded sizes. Many smaller pipe lines come up from time to time, similar to the 1000 tons of 6-inch for a 20-mile line for Southern Crude Oil Purchasing Co., Houston, Tex., allied with Standard Oil Co. of Indiana. This will run from Winkler county to Texas & Pacific railroad. Revival of inquiry for a gas line from Amarillo, Tex., to Denver, encourages the trade to believe that this order for 100,000 to 125,000 tons of 20-inch will be placed early in 1927. The 600-mile line of 10-inch, running 100 tons to the mile, ordered from National Tube Co. recently, is for a line from the Panhandle, Tex., field to Gulf of Mexico, to be laid jointly by Humble Oil Co., Magnolia Petroleum Co., and Gulf Refining Co.

New York, Dec. 7.—Seasonal dullness in cast pipe has led to a downward revision of $1 a ton on 4-inch pipe, and an easier tendency is noted also on 6-inch sizes and over. Municipal demand is at a virtual standstill. Only two small lots of about 100 tons each for this city are noted at the moment. Private inquiry, while fairly active, has yet resulted in little business.

Chicago, Dec. 7.—Cast iron pipe sellers are taking small-lot orders. Makers are looking to heavier business within the next three weeks. Deliveries are much more satisfactory to buyers. Prices are irregular, but $39 to $40, Birmingham, for 6-inch and over, fairly represents the market.

Brimingham, Ala. Dec. 6.—Cast iron pipe lettings are not numerous and tonnages being booked are not heavy. Trade is lagging in this territory. Production has not diminished as yet. Pressure pipe shops probably will ease up in production before the holidays.

Boston, Dec. 7.—Public utilities are coming into the market for 1927 pipe requirements. One company has recently contracted for $150,000 worth of fittings, and is expected to purchase at least 2000 tons of pipe before the end of the year. Municipal buying is quiet. Prices on small sizes hold firm. The Beacon Oil Co. will install a one mile oil pipe line at Hartford, Conn.

CONTRACTS PLACED

1150 tons, 6, 8 and 12-inch pipe for Mt. Prospect, Ill., to National Cast Iron Pipe Co.

500 tons, Wenatchee, Wash., to representatives of French makers.

CONTRACTS PENDING

3100 tons, 8-inch pipe for Detroit; bids received Dec. 9.

200 tons, of which approximately 100 tons are special castings for steel pipe work, department of purchases, New York; general contractors' bids opened Dec. 7.

1900 tons, two lots, Los Angeles, B. Nicholl & Co.

2000 tons, Sacramento, Calif. Bids being taken.

Iron Ore

Cleveland, Dec. 7.—Shipments of Lake Superior iron ore by the water route have been concluded for the season, with a total of 58,538,193 tons, an increase of 4,456,895 tons over 1925. The 1926 figure is the largest since 1923 when 59,036,705 tons of iron ore was shipped by vessel. Previous to that it was exceeded only by several wartime years. December shipments totaled 22,511 tons, including two cargoes which have been held up by the ice in St. Mary's river.

The market is quiet, and little business is expected to develop until after January.

New York, Dec. 7.—Three cargoes of Swedish iron ore have been sold in the past week for early unloading at an Atlantic port.

Alloy Ores Dominate in Philadelphia Imports

Philadelphia, Dec. 7.—Chrome and manganese ore predominated in imports at this port in the week ending Dec. 4. The chrome included 5655 tons from British South Africa, 5150 tons from Portuguese East Africa, and 1840 from Brazil. Manganese ore includes 5473 tons from British West Africa and 2000 tons from Chile.

Pig iron includes 1116 tons from France and 98 tons from Germany. From France 27 tons of blooms were received. Belgium imports include 709 tons of round and square steel rods, 394 tons of structural steel, 26 tons of round steel bars and 25 tons of soft steel bands. From Germany 26 tons of structural steel were received.

Rivet Extra Is Dropped

Notice has been sent to users of structural and boiler rivets by the Townsend Co., New Brighton, Pa., that from Dec. 3 all cone and button head boiler and tank rivets will be sold by that company without extra charge for boiler quality, eliminating entirely extra No. 15 of the standard list of rivet extras which has heretofore required an advance of 20 cents over the base price. This represents a reduction of $4 per ton from established practice in rivet prices.

Bars

Good Business Predicted by Present Attitude of Buyers—Specifications Are Excellent

NUMEROUS signs have appeared in this market to indicate resumption of active buying after usual end-of-the-year events have ceased to have effect. In addition a large tonnage of steel, including steel bars, will be required for the large number of railroad cars on inquiry. Prices have not changed. Some first quarter booking is being done.

BAR PRICES, PAGE 1508

Chicago, Dec. 7.—Gradual accumulation of car inquiries put out intermittently until a total of 15,000 has been recorded, brings a note of cheer to an otherwise drab finished steel market. For these cars it is estimated over 150,000 tons of bars, plates and shapes will be required. Specifications for soft steel bars picked up the last week and spot sales were about twice those of the preceding week, due in part to continued interest on the part of automotive accessory makers, who are preparing to have their products in the yards of some of the automotive works in four to six weeks. The leading producer is content to postpone first quarter contracting, and is placing little of this business on books. Bar shipments show a substantial decline from a month ago, but specifications are about equal to the present rate of shipments.

Rail steel bar shipments are falling off, and buying is diminishing. Bar iron operations are sufficient to meet current demand, which is light.

Soft steel bars are reported firm at 2.10c, Chicago, with few concessions to buyers. Rail steel is quoted at 1.90c to 2.00c, mills, while bar iron is 2.00c.

Boston, Dec. 7.—Bar sales of the week totaled 2000 tons, with inquiry active. The price is firm at 2.00c, Pittsburgh.

Pittsburgh, Dec. 7.—Merchant steel bar activity is progressing as far as first quarter bookings are concerned, more contracts being signed on the 2.00c basis. Releases against this quarter's business are mounting but considerable ground was lost in November which it is thought will be only partially regained this month. Small orders rule, needs being pared down as much as possible. Sellers have had passed on to them improvement in automotive demand noted by cold bar finishers, spring makers and other users.

Refined iron bars are being bought only in small lots, and prices have shown some weakness, starting at 2.90c to 3.00c.

Buffalo, Dec. 7.—Bar prices have settled on a 2.265c base. New business is only fair but specifications indicate an early increase in buying. Mill operation is holding its own.

Youngstown, Dec. 7.—One important steel bar maker in this district has replied to inquiries that its quotation on steel bars for first quarter delivery will be 2.10c for small lots and 2.00c for important tonnage needs and for what universal plates it rolls, its price will be 1.90c, all Pittsburgh base. Several additional steel bar mills resumed operations Monday after a week's idleness, and prospects appear somewhat improved with all local bar mills than appeared a week ago.

Cleveland, Dec. 7.—Bookings for December to date exceed slightly those for the comparable period of November but much business taken now is for January delivery. The automobile industry shows slow but steady improvement. Most consumers are taking in only their absolute requirements. The market is less strong, there being reports of business taken below 1.90c, Cleveland. Some out-of-the-district makers are said to be partially meeting Cleveland mill competition but an important interest adheres to 2.00c, Pittsburgh, or 2.19c.

Philadelphia, Dec. 7.—Steel bar demand has dropped off materially. Mills generally need business but are maintaining 2.00c, Pittssburgh, with 2.10c on occasional small lots.

Hoops and Bands

Impending Automotive Buying Relied On To Give Better Condition

HOOP PRICES, PAGE 1508

Pittsburgh, Dec. 7.—Without the automotive backlog which makes up the bulk of business in hoop and band sizes of hot-rolled flats, makers have to depend upon piecemeal buying by other consuming lines. At present, this is only fair and from present appearances an early improvement is scheduled since automotive users are preparing for enlarge output in January against which orders will have to be placed in December. The price is well maintained at 2.50c.

Early Spar Is Sold

New York, Dec. 7.—Several moderate sized lots of German fluorspar have been sold in the past week for early importation. The price on the 85 and 5 per cent grade continues to range from $16.75 to $17.50, duty paid tidewater, per net ton.

Structural Shapes

Market Active and Awards Are Well Sustained—40,000 Tons on Inquiry in Chicago —No Competition Keen

DEMAND for structural shapes continues active, and the volume of tonnage involved is well sustained, giving mills good operating schedules. Competition is keen in the East, where the market is quoted at 1.90c to 2.00c, Pittsburgh, and several large contracts are pending including 23,500 tons for a subway extension. Sharp competition also is noted at Chicago, inquiries there totaling 40,000 tons. The award of 12,000 tons for the State Bank at Chicago is expected to be made within a few days. Included in the week's transactions are 7270 tons for a group of buildings in New York city, and 4000 tons for an addition to the Baldwin Locomotive Works plant at Eddystone, Pa., awarded to the Belmont Iron Works.

STRUCTURAL SHAPE PRICES, PAGE 1508

New York, Dec. 7.—Fresh inquiry is slack in structurals. However, some substantial projects are pending, so that trading this month should be fairly well sustained. Recent orders are featured by 3600 tons for a plant addition for the Baldwin Locomotive Works, Eddystone, Pa. Shape prices remain firm at 1.90c to 2.00c Pittsburgh, with fabricated material prices showing less steadiness than two weeks ago.

Boston, Dec. 7.—Building is dull. Awards of the past week have been mostly under 100 tons. The price of plain material ranges from 1.90c to 2.00c, Pittsburgh.

Pittsburgh, Dec. 7.—Structural shape activity is slack and practically all fabricators need work. Mills report a tendency to close for first quarter contracts, and in this connection the 2.00c price is unchanged. Awards have been meager.

Buffalo, Dec. 7.—Shape business has been confined largely to small lots. Fabricators are busy on work of this character. Aside from 2250 tons pending for the city hospital no large fabricating business awaits early placement.

Cleveland, Dec. 7.—Inquiries and awards were few and small in the structural steel market during the past week. No action has been taken on the 10,000 tons of bridgework for the Chesapeake & Hocking railroad. Several other large tonnages are pending, but current awards are light. Plain material holds steady at 2.19c Cleveland, with some first quarter contracting at that price.

Chicago, Dec. 7.—Inquiry for structural material approximates 40,000 tons. About half of this is for building projects in Chicago. Several large awards will be closed within the next few days, including 12,000 tons for the State Bank in Chicago, and 2200 tons for a power house for the Standard Oil Co., at Whiting, Ind. The Western Pacific railroad is inquiring for 1000 tons for bridge work, and 4100 tons will be required for Mississippi river bridges at Cape Girardeau, Mo. Competition among fabricators seldom has been keener.

Cincinnati, Dec. 7.—Awards of structural steel the past week were small, but several projects are pending involving large tonnages. The most important is the 3000 tons for the annex to the Union Central Life Insurance Co. building, which will be let by the Ferro Concrete Construction Co., general contractor. The plain material price is 1.90c, Pittsburgh.

Philadelphia, Dec. 7.—Shape demand is appreciably smaller with mills operating at reduced schedules. However the considerable structural tonnage in sight indicates a partial relief from current dullness in the near future. Average prices continue at 1.85c to 2.00c, Pittsburgh.

Awards Compared

	Tons
Awards this week	**38,670**
Awards last week	**14,722**
Awards two weeks ago	**36,405**
Awards this week in 1925	**38,811**
Average weekly awards, Nov.	**27,631**
Average weekly awards, 1926.	**27,817**
Total awards to date, 1925	**1,639,143**
Total awards to date, 1926	**1,373,920**

CONTRACTS PLACED

7270 tons, involved in the following items: 15-story apartment, 310-16 West 106th street, New York, to Taylor-Fichter Construction Co.; 22-story apartment, 109-23 East Fifty-sixth street, New York, to Hay Foundry & Iron Works; 2-story garage, Bainbridge avenue, New York; 2-story community building, Bensonhurst, Long Island; warehouse and garage, Gerard avenue, New York; 13-story apartment, Park Plaza, Brooklyn, N. Y.; 15-story apartment, 321 West Eighty-sixth street, New York; 5-story apartment, Tenth avenue, Long Island City; and a 15-story hotel, 109-15 West Forty-sixth street, New York, all going to the Harris Structural Steel Co. Theater, Forty-sixth street and New Utrecht avenue, Brooklyn, N. Y.; public garage, Sterling place, Brooklyn, N. Y.; and an ice plant, 219th street and Ninth avenue, New York, all going to Levering & Garrigues. St. Joseph's school, Bronxville, New York; power house for Staten Island Edison Co., Staten Island, N. Y.; charger station for the Long Island railroad, Bayridge section, Brooklyn, N. Y.; underground passage for New York board of transportation, Canal street, New York; and a Lutheran hospital, Brooklyn, N. Y.; all going to McClintic-Marshall Co.

4000 tons, locomotive shop for Baldwin Locomotive Works at Eddystone, Pa., to Belmont Iron Works.

4000 tons, two unidentified projects in Pacific Northwest. Bids received.

3000 tons, government project, Twin Falls, Idaho. Bids being taken.

2100 tons, state highway bridge and viaduct at Newark, N. J., to McClintic-Marshall Co.

1800 tons, office building, New Haven, Conn., to Levering & Garrigues.

1800 tons, bridge for Delaware & Hudson railroad, Cohoes, N. Y., to American Bridge Co.

1170 tons, co-operative apartments, 2430 Lake View avenue, Chicago, to American Bridge Co.

1500 tons, bank building, San Diego, Calif. to Virginia Bridge & Iron Co.

1180 tons, Dahl-Stedman Co., general contractors, co-operative duplex apartments 2430 Lake View avenue, Chicago, to American Bridge Co.

995 tons, through riveted truss and plate girder spans for Western Pacific railroad, Elko, Nev., to Virginia Bridge & Iron Co.

950 tons, two bridges over Duwamish River, Seattle. Bids being taken.

830 tons, Washington Park high school, Racine, Wis., to Lakeside Bridge & Steel Co.

700 tons, electrification towers for Pennsylvania railroad at Chester, Pa., to McClintic-Marshall Co.

600 tons, 10-story apartment in East Thirty-sixth street, New York, to Hay Foundry & Iron Works.

600 tons, 11-story apartment in East Sixty-fourth street, New York, to Hedden Iron Construction Co.

550 tons, apartment, 13 East Eighty-fourth street, New York, to Hinkle Iron Works.

500 tons, service station for Bordens Milk Co., New York City, to Hedden Iron Construction Co.

450 tons, Fairbanks Exploration Co. building at Fairbanks, Alaska, to Hofius Steel & Equipment Co. formerly reported as 180 tons.

435 tons, telephone building, Oakland, Calif., California Steel Co.

400 tons, Passaic county sanatarium, Passaic, N. J., to Oltmer Iron Works.

300 tons, apartment, 170 West Eighty-first street, New York, to Drier Iron Works.

300 tons, highway bridge, Dorchester, Mass., to Boston Bridge Works.

300 tons, motion picture theater, Brooklyn, N. Y., to Hinkle Iron Works.

250 tons, theater and apartment, West Ferry, Long Island, to Elby Structural Steel Co.

250 tons, 4-story addition to Title Guarantee & Trust building, New York, to Hedden Iron Construction Co.

200 tons, theater, Klamath Falls, Oreg., through W. D. Miller Construction Co., general contractor, to Minneapolis Steel & Machinery Co.

200 tons, store and loft, 149th street and Southern boulevard, New York City, to Kues Bros.

200 tons, manufacturing plant, San Francisco. Bids being taken.

155 tons, Williams College gymnasium, Williamstown, Mass., to Eastern Bridge Co.

150 tons, beam and deck girder spans for Los Angeles & Salt Lake railroad, Downey road crossing, Los Angeles, Calif., to American Bridge Co.

150 tons, public school, Woodbury, Long Island, to Jones & Laughlin Steel Corp.

150 tons, three apartments, University avenue and 165th street, New York, to Prudential

Iron Works.
150 tons, nurses' home, St. May's hospital, St. Marks, avenue, Brooklyn, to Atlantic Structural Co.
150 tons, warehouse, Fifty-seventh street and Twentieth avenue, Brooklyn, N. Y., to Joseph Gaydica Iron Works.
135 tons, two furniture buildings, one at Sixty-third street and Cottage Grove avenue, and one at Forty-second and Madison streets, Chicago, to Aztec Iron Works.
100 tons, garage, 3801 Tenth street, New York, to Claremont Iron Works.
100 tons, public school, Huntington, Long Island, to Otto Goess.
100 tons, public garage, Englewood, N. J., to J. Cooke & Son.
100 tons, public school, Sayville, Long Island, to American Bridge Co.
100 tons, public school, Nutley, N. J., to Selback-Meyer Co.
100 tons, garage, Bellevue hospital, New York City, to Kues Bros.
100 tons, church, Jackson Heights, Long Island, to I. Platt & Co.
100 tons, loft and store building, Hamilton avenue and Third street, Brooklyn, to Joseph Gaydica Iron Works.

CONTRACTS PENDING

23,500 tons, subway, sections 3 and 4, Route 101, New York; Rosoff Subway Construction Co. low on general contract.
10,000 tons, auditorium at Atlantic City, N. J.; general contract to Consolidated Engineering Co., Atlantic City.
5000 tons, widening Park avenue between East Forty-sixth and fifty-seventh streets, New York; New York Central railroad taking bids.
5000 tons, preliminary estimate for the M. O'Neill department store, Akron, O.; Graham, Anderson, Probst & White, Chicago, architects; bids close Dec. 18.
5000 tons, Cook county jail, Chicago, pending.
5000 tons, 24-story building for Industrial Trust Co., Hartford, Conn., bids in.
4500 tons, structural steel for toll bridge over Mississippi River at Cape Girardeau, Mo., Cape Girardeau Bridge Co., Cape Girardeau, Mo.; pending.
3300 tons reinforcing bars for bridge over Mississippi river at Cape Girardeau, Mo., by Cape Girardeau Bridge Co., Cape Girardeau, Mo.; pending.
3100 tons, bridge work at Twin Falls, Idaho, pending.
3000 tons, 7-story annex, Union Central Life Insurance Co., Cincinnati; general contract awarded Ferro Concrete Construction Co.
3000 tons, Snake river bridge, Twin Falls, Idaho; bids in.
2000 tons, Masonic building, Providence, R. I., bids in on refigured job.
1150 to 1500 tons, Paramount theater, Seattle; Rounds-Clist Co. awarded general contract.
1000 tons, bridge work for Western Pacific railroad; bids in.
700 to 800 tons, annex to Newark, N. J., city hall.
600 tons, school No. 132, Springfield, L. I.
500 tons, building for Childs Co., Atlantic City, N. J.; bids asked.
500 tons, Masonic temple, Scranton, Pa.; bids close Dec. 18.
500 tons, Laurel school, Shaker Heights, O.; bids closed Dec. 7.
500 tons, additional unit for the Presbyterian medical center, New York, bids asked; Marc Eidlitz, general contractor.
450 tons, 6-story professional building, Hanson place, Brooklyn, N. Y., bids asked.
400 tons, Pierce Arrow Motor Co. garage, Boston, bids in on refigured job. Levering & Garrigues low on original bidding.
400 tons, new plant, Prest-O-Lite Co., Cincinnati; bids to be taken shortly.
300 tons, bridge for Erie railroad, Sharon, Pa.; bids asked.
300 tons, alterations, College Hotel building, 5511 Kenwood avenue, Chicago, pending; Adolph Proskauer, 159 North State street, architect.
250 tons, alterations to the White House, Washington; general contractors bids asked.
140 tons, women's physical education building, University of Washington, Seattle; pending.
Unstated tonnage, addition to Jewish hospital, St. Marks avenue, Brooklyn, N. Y.
Unstated tonnage, library for City College of New York.

Michele Electric Hand Saw Co., Chicago, has changed its name to Skilsaw Inc.

Concrete Bars

Recent Awards Restricted to Numerous Small Lots—Eastern Competition Strong

ORDERS for concrete reinforcing bars are limited to small lots, although a fairly good aggregate is reported for the week. New business in prospect includes a round tonnage for a department store planned for Akron, O. The price at Pittsburgh is firm at 2.00c, but valley mills are reported to be shading the market $1 to $2 on eastern competition.

REINFORCING BAR PRICES, PAGE 1508

Chicago, Dec. 7.—Outlook for winter operations of reinforcing steel bar warehouses has been broadened by the award of a number of general contracts and preparation of plans for a number of new projects, some of which will be under way before spring. These include plans for 24 apartment houses, one apartment hotel and several apartment-store-office buildings. November building permits numbered 1154, against 1335 in November, 1925. The value of the building involved was $27,269,000, against $33,145,400 in November, 1925. Awards the past week have declined, but bar warehouses are busy on pending projects.

New York, Dec. 7.—Some irregularity has been reflected in prices on concrete reinforcing bars for shipment out of Youngstown mill stocks. The usual figure is 2.40c, base, Youngstown, but this figure in some cases has been shaded $1 to $2. The 2.00c, base, Pittsburgh, price on shipment at mills' convenience continues fairly firm. The 3.15c price, delivered locally out of New York stocks, also is firm. The amount of tonnage figuring in the current market activity is small.

Pittsburgh, Dec. 7.—While much reinforcing work is pending, no awards beyond the 25 to 50-ton quantities were made. Within the next ten days, however, considerable tonnage will be booked since several general contractors are getting ready to close.

Buffalo, Dec. 7.—Although considerable reinforcing bar inquiry is outstanding, the prospect for future buying is not bright and mill operation has been reduced. Small business is being booked at 2.75c, although large consumers could cover first quarter needs for mill shipment at 2.265c.

Cleveland, Dec. 7.—Concrete bar activity is featured by an inquiry for a large department store in Akron, O. Several small lots are pending, including 640 tons for the Ashtabula, O., highway bridge. Awards include only carload lots or less. Competition is lacking on the general run of present business and 2.19c, Cleveland, is firm on new steel bars. Rail steel is steady at 1.80c, mill. These prices have not been tested for some time.

Cincinnati, Dec. 7.—Recent awards of reinforcing bars were confined to small tonnages, but in the aggregate represented a good volume.

Awards Compared

	Tons
Awards this week	2,595
Awards last week	5,890
Awards two weeks ago	9,670
Awards this week in 1925	3,740
Average weekly awards, Nov.	6,208
Average weekly awards, 1926	6,473
Total awards to date, 1925	294,585
Total awards to date, 1926	312,765

CONTRACTS PLACED

750 tons, school, Milwaukee, to Kalman Steel Co.
350 tons, apartment building, Pratt boulevard and Lakewood avenue, Chicago, to Inland Steel Co.
250 tons, city waterworks, Decatur, Ill., to Mississippi Valley Structural Steel Co.
235 tons for mausoleum at Fairmont, N. J., to Concrete Steel Co.
220 tons, Cleveland school, Detroit, to Concrete Engineering Co.
200 tons, highway work at Rochester, Mich., to Joseph T. Ryerson & Son, Inc
150 tons, apartment house, Laclede and Vandeventer avenues, St. Louis, to Laclede Steel Co.
140 tons, Mather building, Chicago, to Jones & Laughlin Steel Corp.
100 tons, Nazareth academy, La Grange, Ill., to Calumet Steel Co., in addition to another 100 tons awarded Oct. 8.
100 tons, Belmont school, Chicago, to Concrete Engineering Co.
100 tons hospital, Vasalia, Calif. to Kyle & Co.

CONTRACTS PENDING

1200 tons, annex, Union Central Life Insurance Co., Cincinnati; general contract awarded Ferro Concrete Construction Co.
1000 tons, Kittitas canal project, Seattle; bids in Dec. 28.
1000 tons, store building and apartment, Seattle; pending.
700 tons, Montefiore hospital, Pittsburgh; general contract awarded H. Miller & Sons Co., Pittsburgh.
500 tons, Kroger Grocery & Baking Co., warehouse, Cleveland; bids being asked.
250 tons, Clark office building, Pittsburgh; general contract understood to have been awarded a Philadelphia contractor.
200 tons, building for Republic Bank Note Co., Pittsburgh; general contract awarded Rust Engineering Co.
170 tons for Neptune Fireproof Warehouse Co. building, New Rochelle, N. Y. Contract to Barney-Ahlers Construction Co.
150 tons, M. O'Neil department store building, Akron, O.; bids close Dec. 18.
100 tons, Laurel School for Girls, Cleveland; bids in.
100 tons, culvert work for Nickel Plate railroad at Kingsbury Run, O.; bids in.
Tonnage unstated, O'Neill department store, Akron, O.; bids in Dec. 17. Graham, Anderson, Probst & White, Chicago, architects.
260 tons, Jewish hospital, Philadelphia.
190 tons, bridge at Irvineton, Pa.
200 tons wharf, Hawaiian Islands. Bids being taken.
160 tons monastery, San Mateo, Calif. Bids being taken.

Rails, Cars

Railways Announcing 1927 Programs—Southern Line Awards 46,825 Tons of Rails

RAILWAYS are beginning to announce their 1927 programs. The Missouri Pacific is to place orders for $13,000,000 worth of equipment. The Southern Railway has awarded 46,825 tons of rails for delivery in the first half. Freight cars awarded at New York in November totaled 3925, the best month's record since June.

RAILROAD TRACK MATERIAL PRICES, PAGE 1508

Chicago, Dec. 7.—Car inquiries here now exceed 15,000, these being the accumulation of numerous overtures from roads in the past six weeks. Beside the inquiries for 1500 cars by the St. Paul and 2500 by the Rock Island, the Illinois Central is asking for 4000 freight cars and the Santa Fe for 1500 box, 1000 refrigerator and 300 gondola cars, Missouri Pacific invites bids for 3222 freight cars, 68 passengers and 90 locomotives; Chicago & North Western for 250 ore cars; and Illinois Traction Co. for 100 gondolas. Eastern roads placing inquiries in this market include Norfolk & Western, 2000 coal cars; Baltimore & Ohio, 300 freight cars; Atlantic Coast line, 100 freight cars, and Lehigh Valley 750 freight cars. Western car inquiry also includes 59,000 steel axles.

Rail placements with Chicago mills show a substantial gain over the similar period last year. Rails already placed for 1927 delivery are approximately 80 per cent of the tonnage awarded to Chicago mills for shipment in all of 1926. While some rail tonnage is pending, the bulk of 1927 requirements has been ordered.

Inquiry for accessories totals 35,000 tons. The 10,000 tons of fastenings for Chesapeake & Ohio and Chesapeake & Hocking are reported to have been placed with a Wheeling mill.

Division of the New York Central track fastening order was as follows: Tie plates—Illinois 1,050,000 plates, Bethlehem 780,000, Inland 250,000, Dillworth Porter 320,000, Jones & Laughlin 100,000; spikes—Illinois 8500 kegs, Bethlehem 6000, Jones & Laughlin 3000, Inland 2500; angle bars—Illinois 57,100 bars, Inland 17,600, Bethlehem 4000; track bolts—Illinois 1000 kegs, Inland 400, Bourne-Fuller 400 and Oliver 200.

Boston, Dec. 7.—Boston & Maine railroad is buying material for new shops at Billerica, Mass., and is expected to buy 15,000 tons of rails for its 1927 requirements before the end of the year.

Pittsburgh, Dec. 7.—Light rail buying keeps up intermittently from coal mining districts. One important seller averages several carloads daily, and the leading interest continues to receive regular specifications against contracts. All transactions carry the $36 price. Rerollers usually quote $34, although some have been naming slightly higher figures and claim to be receiving their usual quotas.

Small orders of small spikes continue to reach fairly heavy tonnages in the aggregate from coal mining sections, many carrying a 3.00c figure. On standard spikes, 2.90c still applies to other than steam railroads which continue to be quoted at 2.80c. The market price on tie plates continues unchanged at $47, but that level is subjected to some shading in the way of freight rate adjustments or concessions for preferential tonnages.

New York, Dec. 7.—With a total of 3925 freight cars awarded, November proved the best month since June, when 4285 were placed. The total for the first 11 months stands at 51,585, compared with 77,110 cars for all of 1925 and 144,425 for 1924. A comparative statement follows:

November	3,925
October	2,840
September	3,335
August	152
July	1,265
June	4,285
May	448
April	4,615
March	8,995
February	12,895
January, 1926	8,830
1925	
December	16,885
November	11,685
October	11,145
1923 total	103,487
1924 total	144,425
1925 total	77,110
1926 total, 11 months	51,585

While it is doubtful whether this year will equal 1925, sufficient inquiry is out to justify the belief that this month will be one of the best this year. Inquiry is featured by 3222 freight cars for the Missouri Pacific, is also in the market for 46 locomotives.

Imperial Government railways of Japan have placed 8600 tons of 100-pound rails with Mitsui & Co., who, in turn, placed the business with a European mill.

Formal announcement of the awarding of 46,825 tons of new steel rails has been made by R. B. Pagram, of Atlanta, vice president of the Southern Railway system. The order was placed with the Tennessee Coal, Iron & Railroad Co., Birmingham, Ala., for delivery during the first six months of 1927.

St. Louis, Dec. 7.—President L. W. Baldwin of the Missouri Pacific railroad has announced that his company will place orders for $13,000,000 of new equipment to be delivered in 1927. The equipment will consist of 46 locomotives, 70 all-steel passenger cars and 3222 freight cars, in addition to miscellaneous equipment. These orders are in addition to those placed the past year for 40 locomotives, 80 passenger cars, 3050 freight cars, 2000 refrigerator cars and eight motor cars. The company has recently authorized the purchase of 70,000 tons of 90-pound rails and 6,500,000 steel tie plates, to be installed next year. The new equipment will be distributed, among the Missouri Pacific, the Gulf Coast Lines and the International & Great Northern, but chiefly to the Missouri Pacific. Among the miscellaneous items are two steam wrecking derricks, two clam-shell shovels and two rail unloaders.

Philadelphia, Dec. 7.—Pennsylvania railroad opened bids yesterday on not to exceed 1,000,000 tie plates, 175,000 pairs of angle bars, 4,500,000 pounds of spikes, 830,000 track bolts.

CAR ORDERS PLACED

Barnes Coal Co., 200 mine cars to Bethlehem Steel Co.

Death Valley railroad, one gasoline rail motor coach, to J. G. Brill Co.

Norfolk & Western, 250 box cars and 25 caboose cars, to its own shops at Roanoke, Va.

Pacific Fruit Express Co., 600 underframes, to Pacific Car & Foundry Co.

Union Pacific, 25 miscellaneous coaches, awarded as follows: 18 to the Pullman Car & Mfg. Corp., 10 to Standard Steel Car Co., 5 to Bethlehem Shipbuilding Corp. and 2 to American Car & Foundry Co.

LOCOMOTIVE ORDERS PLACED

East Jersey Railroad Terminal, switch engine, to Baldwin Locomotive Works.

Hampton & Branchville, one locomotive to Baldwin Locomotive Works.

Montana, Wyoming & Southern, one locomotive to Baldwin Locomotive Works.

Norfolk Southern, three locomotives, to Baldwin Locomotive Works.

CAR ORDERS PENDING

Atlantic Coast Line, 100 ballast cars; bids opened Dec. 7.

Burlington, inquiry for 200 sets of center sills and 200 underframes for refrigerator express cars, revived.

Gulf, Mobile & Northern, two passenger cars.

Jamaica Government railways, 25 to 30 box cars; bids asked.

Lehigh Valley, 500 box cars, bids asked; these are in addition to 750 cars previously noted as pending.

Missouri Pacific, 3,222 freight cars, bids asked; included are 1250 box cars, 100 gondola cars, 100 ballast cars, 20 caboose cars, 1250 automobile cars, 250 stock cars, 250 hopper cars, and two air dump cars.

Santa Fe, purchase of 1000 refrigerator, 1500 box, 300 coal, 100 ballast, 50 caboose and 58 passenger cars authorized.

Cushing Refining & Gasoline Co., 25 insulated tank cars.

LOCOMOTIVE ORDERS PENDING

Missouri Pacific, 46 locomotives; bids asked.

Pipe Rate Unreasonable

Washington, Dec. 7.—The rate on wrought iron pipe, in carloads, from Bowling Green, Ky., to Florence, Ala., has been found unreasonable by the interstate commerce commission in a decision in the case of the Nashville Machine & Supply Co. against the Louisville & Nashville railroad. A reasonable rate has been prescribed and reparation awarded.

Wire

Releases After New Year Now Being Negotiated—Jobbers Buying Steadily

MAKERS of wire and nails find the present situation quiet but reservations to be released for January delivery promise to give the market some activity then. Manufacturers are taking fairly large tonnages but are holding inventory as low as possible. Jobbers are buying some tonnage, indicating a good consumptive demand in general.

WIRE PRICES, PAGE 1508

Pittsburgh, Dec. 7.—Prospects in wire products are brighter. Much business is being held for release shortly after the first of the year, when with the holiday season and inventory periods passed jobbers will replenish stocks. Definite promises are in hand by various makers involving single straight carloads as well as mixed carload orders which will be accepted in January. Manufacturers are specifying fairly well on various grades of wire, but are keeping stocks as low as possible. Operations among producers average 50 to 55 per cent and probably will be kept there until after the first of the year. Base prices are firm, plain wire being unchanged at 2.50c and wire nails at 2.65c.

Boston, Dec. 7.—Wire production holds at close to 60 per cent, but new orders are coming in slowly. Plain wire is nominally quoted at 2.65c, Worcester, but this is being shaded for delivery to other points. Nails are fairly active.

Chicago, Dec. 7.—Producers of wire products are booking some business from the manufacturing trade for first quarter, but sales thus far have been light. Jobbing demand continues weak, although stocks are so low that the specifying by jobbers indicates a fair consumptive demand. Operations are not above 50 per cent.

Bolts, Nuts, Rivets

First Quarter Buying Starts with Prices Unchanged

NUT AND BOLT PRICES, PAGE 1508

Chicago, Dec. 7.—Books for first quarter contracts for bolts, nuts and rivets are being opened on the basis of present quotations. Quotations are on the basis of 50, 10 and 10 off for large machine bolts, 50 and 10 plus 20 per cent off for plow bolts, 50 and 10 off for carriage bolts, and 80, 10 and 5 off for stove bolts in bulk. In packages, 80, 10 and 5 plus 2½ off applies for the latter. These lots. Carloads take an extra 5 per quotations are for less than carload cent on carriage, machine and plow bolts and lag screws. An extra 25 cents per 100 pounds is added on less-carloads to jobbers and carloads to consumers on cold punched and hot pressed nuts. Specifications from farm implement interests and railroads are lagging. Automotive business has been sharply reduced. Operations are no higher than 60 per cent.

Pittsburgh, Dec. 7.—Contract activity in nuts, bolts and rivets for first quarter is getting into its stride. Shipping instructions against the present quarter's business are not large but come from numerous directions. Increased buying on the part of jobbers is noted to bring stocks into alignment following the completion of inventories. While nut and bolt prices are firm, rivet quotations still are subjected to concessions, depending upon the size of the order, 2.40c to 2.50c being quoted against the regular market price of 2.60c.

Philadelphia, Dec. 7.—Bolt and nut makers have opened books for first quarter on the basis of 50, 10 and 10 off for large machine bolts, unchanged except that an additional 5 per cent is allowed jobbers on all purchases whereas an extra 5 per cent is given consumers only on carloads. Current demand is light.

Rivet demand is small. Prices range from 2.50c to 2.60c, Pittsburgh, with little test.

Strip Steel

Hot Strip Firm, with Competition Ruling on Cold Product

STRIP PRICES, PAGE 1508

Pittsburgh, Dec. 7.—Hot and cold rolled strip orders are a little more numerous from the automotive trade, but fairly large outside of it. Some users continue to defer buying until after the holidays. Others are still holding back on account of inventories, while a few are getting positions on makers' books in order to obtain material promptly early in January. Several are releasing material on which they recently requested that shipments be held up. Operations do not average higher than 60 or 65 per cent. While the hot strip price remains firm at 2.30c, competition is still keen on cold. Each order for cold strips is judged on its own merits, both as to size and extras. A fair approximation of market quotations is 3.25c to 3.50c although some prices as low as 3.00c have lately appeared.

Cleveland, Dec. 7.—Strip steel activity in this district continues to droop. Hot rolled strip is maintaining better strength in prices and demand than cold rolled. Quotations on the former are 2.30c for wide and 2.50c for narrow, with little shading. Cold rolled strip is weak, and 3.00c, Pittsburgh, possible on attractive business, and 3.25c more common. Some business continues to be placed at 3.40c.

Chicago, Dec. 7.—Competition being keen on hot rolled strip business, some weakness in prices on narrower widths is manifest. The quotation for hot rolled strip is 2.50c to 2.60c, with considerable business going at the lower figure.

Cold Finished Steel

Improvement Slight but Discernible and Situation Is Firm

Pittsburgh, Dec. 7.—Improvement in cold finished bars, while discernible from day to day, is mostly prospective. Some automotive customers planning on increased schedules in January have sent in releases and promise more before the month is out. Until this activity really develops, operations among cold finishers will be kept down to the present 50 per cent level. Some other users are fairly active. But total tonnage involved in any one case is not heavy. Several makers here claim not to have deviated from 2.40c, which is openly quoted on ordinary tonnages.

Locomotive Orders Drop

Washington, Dec. 7.—Railroad locomotive shipments in November, totaling 128, were the lowest since August, and fell off from 151 in October, according to returns to the department of commerce. Unfilled orders in November, however, were 517, a gain of 390 over October. Further comparisons follow:

Year and Month	Shipments			Unfilled order		
		Domestic			Domestic	
	Total	Steam	Electric	Total	Steam	Electric
1920	2,683	1,318	306	.....	.....	.....
1921	1,558	830	221	.....	.....	.....
1922	1,405	1,056	128	.....	.....	.....
1923	3,378	2,982	207	.....	.....	.....
1924	1,554	1,312	99	.....	.....	.....
1925						
Nov.	106	52	8	585	435	46
Total (11 mo.)	1,112	687	126	.....	.....	.....
Dec.	104	68	18	708	557	54
Total	1,216	755	144	.....	.....	.....
1926						
Jan.	121	96	11	653	506	53
Feb.	163	101	22	572	442	60
March	162	146	11	780	635	50
April	151	122	12	713	580	44
May	140	105	14	726	585	46
June	159	133	11	667	522	53
July	132	82	20	555	445	36
Aug.	124	78	16	525	455	26
Sept.	134	109	13	498	386	24
Oct	151	124	15	390	286	20
Nov.	128	109	15	517	391	27
Total (11 mo.)	1,565	1,205	160	.....	.....	.....

Nonferrous Metals

Copper Price Jumps Sharply Following Development of Big Buying Movement—Tin, Zinc and Lead Continue to Sag

Prices of the Week, Cents a Pound

	Copper			Spot		Lead					
	Electro delivered	Lake delivered	Casting refinery	Straits Tin, N. Y.	Lead New York	East St. Louis	Zinc St. Louis	98-99% Aluminum	Spot Antimony	Ingot Nickel
Dec. 1	13.55	13.70	13.27½	71.37½	8.00	7.80	7.10	26.80	14.00	35.00
Dec. 2	13.52½	13.70	13.25	70.87½	7.95	7.80	7.10	26.80	13.90	35.00
Dec. 3	13.50	13.62½	13.25	71.00	7.95	7.77½	7.05	26.80	13.87½	35.00
Dec. 6	13.50	13.65	13.20	70.75	7.90	7.77½	7.02½	26.80	12.75	35.00
Dec. 7	13.60	13.75	13.20	69.75	7.90	7.70	7.00	26.80	13.75	35.00

NEW YORK, Dec. 7.—Prices of nearly all the nonferrous metals declined during the past week but an outstanding development was the sudden increase in copper business, which was reflected today in prices jumping ⅛-cent.

Copper—Buyers apparently were waiting for the price of this metal to reach 13.50c, Connecticut, (13.62½c, Midwest) for as soon as this level was reached, the market became active. It had been unusually quiet for several weeks. Buying began on a large scale Friday noon and by Monday afternoon as much as an average week's business had been done. Some producers then began to pull away from the 13.50c figure and today the market was full ¼-cent higher. Export business has been moderate at 13.95c c.i.f. Copper wire prices were cut ¼c Dec. 3 but today the American Brass Co. announced an advance of ⅛c in copper wire in line with renewed strength in the copper market.

Tin—Buying by users has been light on most days lately and with more metal reported shipped from the Far East the market sagged to 70c on spot Monday and about ¾-cent less for December arrival and approximately 1 cent down each succeeding month. Today spot dropped to 69.75c.

Lead—The heavy metal dropped to 7.90c New York Monday afternoon after some open market prices had appeared at about this level several days ago. For about a month lead has been the most steady of the metals, at 8.00c, New York. It has been in fairly active demand while other metals have been slow.

Zinc—Demand has been dull and with only limited tonnages moving prices have steadily declined. Today, however ,with the market definitely at 7.00c, East St. Louis, the lowest in months, more interest developed. Zinc sheet prices were cut ¼-cent today to 11.50c, the first change in price of this commodity since last July.

Antimony—Little change has developed in this metal and the market has fluctuated but little.

Aluminum—Remelt metal is in slow demand and with the scrap market weak prices have been cut, so that remelt No. 12 now is held at 21.50c to 22c. The virgin aluminum market is featureless and despite reports of price shading the Aluminum Co. of America is holding to 27.00c for the foundry grade.

Coke By-Products

Supply Continues Ample and all Quotations Continue Steady

New York, Dec. 7.—Despite a decline in iron and steel operations, supplies of by-products continue adequate and no changes in quotations are expected. Pure and 90 per cent benzols are holding at 24 cents, works, per gallon for material in tank car lots and 29 cents in drums; toluol and solvent naptha, 35 cents, works, in tanks and 40 cents in drums; commercial xylol, 36 cents in tanks and 41 cents in drums. Toluol and solvent naptha continue in heavy demand from paint and lacquer manufacturers.

Trading in sulphate of ammonia is slack, with prices nominally unchanged at $2.45 to $2.50, delivered, for material for domestic account and $2.50 to $2.55, port, for double bags for export. Seasonal dullness also prevails in napthalene. Prices on flakes are easy at 5 to 7 cents, works, and balls at 6 to 8 cents. Phenol is featureless and unchanged at 22 cents, works.

Mill Products

Base prices cents per pound, f.o.b. mill

SHEETS	
High brass	18.62½
Copper, hot rolled	22.25
Zinc, (100-pound base)	11.50
Lead full sheets (cut ¼c more)	11.75 to 12.25
Aluminum, bright flat, up to 10 gage	36.50
SEAMLESS TUBES	
High brass	23.50
Copper	24.25
RODS	
High brass (round ⅝ to 2½-inch	16.37½
Naval brass	19.12½
WIRE	
Copper, small lots	15.62½
High brass	19.12½

Old Metals

Dealers' buying prices, cents per pound

HEAVY RED BRASS	
New York	8.25 to 8.50
Chicago	8.75 to 9.00
Cleveland	9.00
HEAVY YELLOW BRASS	
Chicago	7.50 to 7.75
Cleveland	6.50
ZINC	
New York	4.25
Cleveland	3.25 to 3.75
HEAVY COPPER AND WIRE	
New York	10.75 to 11.00
Boston	10.00 to 11.00
Chicago	10.25 to 11.00
Cleveland	10.75 to 11.00
RED BRASS BORINGS	
New York	7.75 to 8.00
YELLOW BRASS TUBING	
Cleveland	6.50
LIGHT COPPER	
New York	8.75 to 9.00
Chicago	9.25 to 9.50
Cleveland	8.50 to 9.00
LIGHT BRASS	
Boston	6.00 to 6.50
Chicago	6.25 to 6.50
Cleveland	5.00 to 5.50
ALUMINUM	
Clippings, Cleveland	17.50 to 19.50
Borings, Cleveland	12.50
Cast, Cleveland	13.50 to 16.00
Cast, Boston	18.00 to 18.25

Secondary Metals

Remelt aluminum No. 12	21.50 to 22.00
Brass ingot, 85-5-5-5	11.50 to 11.75

Coke Oven By-Products

Per Gallon at Producers' Plants in Tank Lots

	Spot	Contract
Pure benzol	$0.24	
90 per cent benzol	0.24	
Toluol	0.35	
Solvent naphtha	0.35	(nominal)
Commercial xylol	0.36	(nominal)
Phenol	0.22	0.22

Per Pound at Producers' Plants

Naphthalene flakes	0.05 to 0.07
Naphthalene balls	0.06 to 0.08

Per 100 Pounds Delivered

Sulphate of ammonia	2.47½	

Soft Coal Output Still at Record Rate

Had there been no Thanksgiving holiday another weekly record for the production of bituminous coal would have been set in the week ended Nov. 27, states the federal bureau of mines. As it was, output totaled 13,409,000 net tons. This was at a daily rate of 2,438,000 tons, against a daily rate of 2,380,000 tons and a total of 14,282,000 tons in the week preceding.

Beehive coke production continues to shrink. In the week ended Nov. 27 it was 198,000 tons, compared with 205,000 tons in the week preceding and 292,000 tons in the corresponding week of 1925. The daily rates for the three weeks were 33,000, 34,000 and 49,000 tons, respectively. For the year to date output of beehive coke has totaled 10,644,000 net tons. A year ago this figure stood at 9,314,000 tons.

Warehouse

Pre-Inventory Lull Becoming Noticeable in Some Districts—Buying Generally Maintained at High Level—Prices Are Steady

DECEMBER sales from iron and steel warehouses are holding unusually well to the high levels of November. Although pre-inventory lull is being encountered in some cases, generally warehouses expect to find increased business as consumers seek prompt fill-in lots. Prices are steady with a minimum of shading in most products.

Following one of the best months this year in the New York metropolitan district, jobbing business during the past week has somewhat succumbed to seasonal influences, being only moderately active. Structurals and sheets are moving in good volume with improved buying in plates a feature. Prices remain unchanged.

Buffalo iron and steel warehouses report the uusual pre-holiday decline in business. Buying is confined almost entirely to small lots. Galvanized sheets continue a leader in demand. Prices are steady and well maintained. Early December business has just about equaled that of the same period of 1925.

Sales totals for iron and steel warehouses in the Cleveland district fell off slightly in November from October. Business the first few days of December compared favorably with the similar period of November and were ahead of December, 1925. Buying on the part of automobile parts makers has increased slightly. Prices for local trading are firm, occasional shading in sales to outside points still being encountered.

Cautious but diversified buying still exists among warehouses in the Pittsburgh district. Inventory season, with the tendency more pronounced to buy tonnages smaller than mills care to handle, is resulting in increased orders from warehouses. The speculative element is lacking, all buying being done for actual jobs, either under way or in sight. Hand-to-mouth buying in sheets, is heavy. Cold finished bars have registered a decided improvement. All price levels are firmly held.

Early reports indicate November business of St. Louis warehouses to have been satisfactory above expectations, and slightly larger than the high total of the same period last

(*Concluded on Page* 1523)

Quotations in Cents Per Pound at Leading Market Centers

STEEL BARS

Boston	3.265c
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.15c
Ft. Worth	3.75c
Los Angeles	3.30c
New York	3.24c
Philadelphia	2.90c to 3.20c
Pittsburgh	2.90c
Portland	3.00c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.15c
St. Paul	3.25c
Tulsa	3.80c to 4.06c

IRON BARS

Boston	3.265
Buffalo	3.30c
Chicago	3.00c
Cincinnati	3.30c
Detroit	3.15c
Ft. Worth	3.75c
New York	3.24c
Philadelphia	2.90c to 3.20c
St. Louis	3.15c
Tulsa	3.80c to 4.06c

REINFORCING BARS

Boston	3.265 to 3.50c
Buffalo	3.30c
Chicago, billet	2.25c to 2.60c
Chicago rail steel	2.00c
Cincinnati	3.20c to 3.30c
Cleveland	2.50c to 3.00c
Detroit	3.15c
Ft. Worth	3.75c
Los Angeles, C.L.	3.05c
Los Angeles, L. C. L.	3.30c
New York	3.15c
Philadelphia	3.00c to 3.15c
Pittsburgh	2.50c to 2.60c
San Francisco, C. L.	2.30c
San Francisco, L C. L.	2.45c
Seattle	3.00c
St. Louis	3.15c
Tulsa	3.75c to 4.00c
Youngstown	2.50c to 2.60c

STANDARD STRUCTURAL SHAPES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.30c
Cleveland	3.00c
Detroit	3.25c
Ft. Worth	4.50c
Los Angeles	3.20c
New York	3.34c
Philadelphia	2.75c to 3.20c
Pittsburgh	3.00c
Portland	3.10c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.35c
Tulsa	3.80c to 4.16c

PLATES

Boston	3.365c
Buffalo	3.40c
Chicago	3.10c
Cincinnati	3.40c
Cleveland, ¼-inch and thicker	3.00c
Cleveland, 3/16-inch	3.225c
Detroit	3.25c
Detroit, 3/16-inch	3.45c
Ft. Worth	4.50c
Los Angeles	3.20c
New York (sheared and universal)	3.34c
New York (floor)	5.25c
Philadelphia	2.75c to 3.20c
Philadelphia, 3/16-inch	2.95c to 3.40c
Pittsburgh	3.00c
Portland	3.25c
San Francisco	3.30c
Seattle	3.00c
St. Louis	3.25c
St. Paul	3.25c
Tulsa	3.80c to 4.16c

NO. 10 BLUE ANNEALED SHEETS

Boston 3/16-inch	3.915c
Buffalo	3.80c
Chicago	3.50c
Cincinnati	3.60c
Cleveland	3.25c
Detroit	3.65c
Los Angeles	4.00c
New York	3.89c
Portland	4.25c
Philadelphia	3.50c
Pittsburgh	3.40c
San Francisco	4.00c
Seattle	4.25c
St. Louis	3.60c
St. Paul	3.75c
Tulsa	4.05c to 4.25c

NO. 24 BLACK SHEETS

Boston	5.10c
Buffalo	4.30c
Chicago	3.95c
Cincinnati	4.05c
Cleveland	3.80c
Detroit	4.10c
Ft. Worth	4.70c
Los Angeles	5.00c
New York	4.35c
Philadelphia	4.35c
Pittsburgh	3.95c
Portland	4.90c
San Francisco	4.90c
Seattle	4.90c
St. Louis	4.45c
St. Paul	4.20c
Tulsa, No. 28	5.00c

NO. 24 GALVANIZED SHEETS

Boston	5.80c
Buffalo	5.15c
Chicago	4.80c
Cincinnati	4.90c
Cleveland	4.65c
Detroit	5.05c
Ft. Worth	5.90c
Los Angeles	5.75c
New York	5.10c
Philadelphia	5.30c
Pittsburgh	4.80c
Portland	5.75c
San Francisco	5.65c
Seattle	5.75c
St. Louis	5.25c
St. Paul	5.15c
Tulsa, No. 28	6.00 to 6.31c

BANDS

Boston	4.015c
Buffalo	4.05c
Chicago	3.65c
Cincinnati	3.95c
Cleveland	3.65c
Detroit	3.80c
Ft. Worth	4.40c
Los Angeles	4.05c
New York	3.99c
Philadelphia	3.75c to 3.90c
Pittsburgh	3.60c
Portland	4.25c
San Francisco	4.15c
Seattle	4.00c
St. Paul	3.90c
Tulsa	4.71c

HOOPS

Boston	5.50c
Buffalo	4.05c
Chicago	4.15c
Cleveland	3.65c
Detroit	4.30c
New York	4.49c
Philadelphia	4.00c to 4.25c
Pittsburgh	4.50c
Seattle	5.00c
St. Paul	4.40c

COLD FINISHED STEEL

	Rounds and hexagons	Flats and squares
Boston	4.05c	4.55c
Buffalo	3.90c	4.45c
Chicago	3.60c	4.10c
Cincinnati	3.85c	4.35c
Cleveland	3.90c	4.40c
Detroit	3.85c	4.35c
Los Angeles	5.25c*	.....
New York	4.00c	4.50c
Philadelphia	4.00c	4.50c
Pittsburgh	3.60c	4.10c
Portland	5.00c*	.....
San Francisco	4.25c*	.....
Seattle	5.00c*	.....
St. Paul	3.85c	.....
Tulsa	4.66c	5.16c

*Rounds only.

COLD ROLLED STRIP

Boston, 0.100 inch, 500 lbs. lots	6.15c
Buffalo	6.25c
Chicago	6.25c
Cincinnati	7.15c
Cleveland, over 500 lbs. lots	5.95c
Detroit	6.20c
New York	6.25c
Philadelphia	6.25c
Pittsburgh	6.30c

FOREIGN IRON AND STEEL

New York duty paid

Swedish, hollow drill steel	15.00c
Swedish iron bars round	6.25c
Flats and squares	6.50c

WELDED PIPE

Discounts from warehouse, New York City Standard Steel Pipe

WROUGHT STEEL PIPE

	Black	Galvanized
⅛-inch butt	—28	+21
¼ to ⅝-inch butt	—36	— 3
½-inch butt	—46	—29
¾-inch butt	—51	—37
1 to 3-inch butt	—53	—39
2-inch lap	—40	—22
2½ to 6-inch lap	—48	—35
7 and 8-inch lap	—44	—17
9 and 10-inch lap	—38	—14
11 and 12-inch lap	—37	—12

WROUGHT IRON PIPE

	Black	Galvanized
⅛ to ⅝-inch butt	+44%	+78%
½-inch butt	— 4	+19
¾-inch butt	— 1	+ 9
1 to 1½-inch butt	—14	+ 6
2-inch lap	— 5	+14
2½-inch lap	— 9	+ 6
3 to 6-inch lap	— 3	+ 6
7 to 12-inch lap	— 3	+16

Northwest Trade Quiet

Decreased Demand for Some Forms of Steel but Much Buying Is in Prospect

SEATTLE, Dec. 3.—Turnover in iron and steel is somewhat limited but business in prospect is greater than normal and several large contracts are to be up for award shortly. Prices remain firm although holiday sentiment is serving to slow up interest.

One of the largest industrial electrical contracts awarded in months went to Jagger-Stroufe Co. in connection with the waterfront improvement at Portland. It includes pumping plant and all electrically controlled apparatus in connection therewith at a cost of $100,000. J. F. Shea & Co. have the general contract.

Bars, Plates and Shapes

There is decreased demand for reinforcing material, recent award having been in small tonnages, mostly car lots. No large tonnages are immediately pending the largest involving 1000 tons for the Kittitas canal, bids Dec. 28. Wholesale houses are not buying as they are reducing stocks prior to inventory. Operations of the Pacific Coast Steel Co. remain unchanged. Prices of merchant bars are firm at 2.35c. No recent inquiries for bars are noted from the Orient, Philippines or Hawaiian islands.

While mill representatives report inquiry dull, prices of plates and shapes are unchanged at 2.30c and 2.35c, respectively.

The trade is awaiting with interest opening of bids late this week for the Yakima water system involving 2700 tons of plates. Pacific Car & Foundry Co. has obtained a contract for furnishing 600 underframes for the Pacific Fruit Express Co. involving about 1500 tons of plates and an equal tonnage of shapes. These cars are to be fabricated at the Portland plant.

Awards of shapes this week include 200 tons to the Minneapolis Steel & Machinery Co. for a theater at Klamath Falls, Oreg., general contract to W. D. Miller Construction Co., Reid Bros., San Francisco, architects. Hofius Steel & Equipment Co., Seattle, has the contract for the University bank alterations involving 32 tons of structurals. The same firm is fabricating 450 tons for the Fairbanks Exploration Co., Fairbanks, Alaska. Tonnages pending include 140 tons for the Woman's Physical Education building, University of Washington, bids Dec. 6; 3000 tons for the Snake river bridge, Twin Falls, Idaho., bids opened at Portland this week, and 1150 tons for the Paramount theater, Seattle, for which the general contract was awarded last week.

Finished Materials

As a whole the jobbing trade is quiet although the last week witnessed slightly more activity. There has been no recent change in price. Sheets, light plates and small shapes are in fair demand for construction and repair work.

Westinghouse Electric & Mfg. Co., through the Seattle office, has taken a contract for furnishing electric motors and controls for the Weyerhaeuser Timber Co. plant.

Seattle has appropriated $35,000 for the purchase of about 400 tons, of cast iron pipe for new main water trunk lines. Awards of about 500 tons of cast iron pipe for the new water system at Wenatchee, Wash., has been made by the contractors to representatives of French manufacturers.

American Cast Iron Pipe Co., Seattle, has recently been awarded several city contracts, the largest of which involves more than 500 tons.

Old Materials

Great Northern railroad was low bidder and received the award for furnishing Seattle with approximately 500 tons, or 4½ miles, of 72 pound relay rails at $30 per gross ton. This material will be used in extending the city's Skagit river road to the site of new construction work.

The steel scrap market is unchanged with local plants paying $10.50 and $11, gross, receipts being somewhat heavier than consumption. Little interest is being shown by exporters at present prices. Foundry activity is limited so the turnover of cast iron scrap is less than normal with prices none too firm at $16.50, gross.

Storms Hold Back Work

SAN FRANCISCO, Dec. 4.—(*Via Air Mail*)—Construction activity all along the coast has been seriously held up during the past ten days or two weeks by severe storms. In the San Francisco district the rainfall has been over three times normal and work on many projects has been stopped. This, together with the approach of holiday and inventory season has resulted in a decided slowing up of business.

The Columbia Steel Corp. which recently took over the sheet plant of the Pacific Sheet Steel Corp., at South San Francisco, it is understood will move this plant to Torrence, Calif. Operations have started in the new plant of the Pacific States Cast Iron Pipe Co. at Provo, Utah. Both the McWane Cast Iron Pipe Co. and the Columbia Steel Corp. are heavily interested in this company.

Pig Iron and Coke

Little pig iron is being sold at present and inquiries are limited to occasional small lots. Foundry operations are on a lower scale than at any time this year. While interest in coke is more pronounced, due to the foreign situation, few sales or inquiries are noted. Prices on pig iron are unchanged.

Bars, Plates and Shapes

Excessive rains in the northern part of California have had a decided effect on the concrete bar market as practically all construction work has either been slowed up or has stopped entirely. Only one award was reported. This involved 100 tons for a hospital in Visalia, Calif.. awarded to Kyle & Co. Pending business aggregates close to 5500 tons, new inquiries calling for 200 tons for a wharf in the Hawaiian Islands and 160 tons for a monastery at San Mateo, Calif. Mild steel bar demand continues slow. The Western Harvester Co., Stockton, has placed a small portion of its 600-ton inquiry for hot rolled material with a local mill. Concrete bars still are quoted at the low out-of-stock price of 2.30c to 2.45c.

Plate business during the week involved only small lots. Opening of bids on the Yakima, Wash., pipe line project has been postponed to Dec. 13. Originally it was estimated this line would require from 6000 to 10,000 tons. According to the present specifications, only 3000 tons will be needed. No action has yet been taken on the 550 tons inquiry of the East Bay Water Co. The Associated Oil Co. at San Francisco is asking for figures on three 80,000-barrel tanks, 930 tons. Pending business totals over 11,000 tons. Prices are firm at 2.30c c.i.f.

Movement of structural steel shapes continues fair. Awards this week exceeded 2100 tons. The Virginia Bridge & Iron Co. booked 1500 tons for a bank building in San Diego and California Steel Co., 435 tons for a telephone building in Oakland. Pending business aggregates over 22,000 tons. New inquiries call for 3000 tons for a government project at Twin Falls, Idaho, 950 tons for two bridges over the Duwamish river, Seattle and 200 tons for a manufacturing plant in San Francisco. Bids have been received on two large projects in the Pacific Northwest involving 4000 tons. Prices continue firm at 2.35c, c.i.f.

Other Finished Material

The city of San Francisco placed 200 tons of 70-pound rails and 832 kegs of track bolts and spikes with the Bethlehem Steel Co. and 1226 tons of 98, 106 and 129-pound rail with the United States Steel Products Co. The St. Louis Car Co. was awarded 15 new car bodies at $9684 each.

Carnegie Veteran Ends Long Service

John Houghton retired from active work as superintendent of the Carnegie Steel Co.'s furnace at Steubenville, O., Nov. 30 and was placed on the retired list by the Carnegie Steel Co., with honorable mention for his 54 years' service. In his honor the superintendent's club at Mingo entertained him at luncheon when Mr. Houghton, who has been superintendent of the Steubenville furnace for years, was felicitated in speeches by the other superintendents, to which Mr. Houghton made response.

Mr. Houghton in 1874 at the age of 11 years started as water boy at the Lucy furnace at Pittsburgh, and saw the first cast of iron ever made at that furnace. As superintendent of Steubenville furnaces he saw the final cast of iron at that furnace in 1918. He located in Mingo Junction in 1878, and started to work for the Junction Iron & Steel Co. He has worked at Mingo, Bellaire and Steubenville furnaces for the Carnegie Steel Co.

Plan for Engine Works at St. Louis Dropped

The American Locomotive Co. has sold to the Commonwealth Steel Co., St. Louis, the 172-acre tract at Madison, Ill., which it purchased five years ago for the ostensible purpose of developing a locomotive plant. Clarence Howard, president of the Commonwealth company, states that the purchase does not indicate any expansion or plans for a locomotive plant by his company. Since the Commonwealth company was instrumental in inducing the American company to buy the property in hopes of building a plant on it, Mr. Howard said he felt the Commonwealth company should take the tract off of the locomotive concern's hands when the project for a western branch failed to materialize.

With the growth of the East Side steel industries in recent years, the St. Louis industrial district was considered a logical place for a big locomotive plant, and action of the American company is a disappointment. However, a start has been made. The St. Louis Terminal Railway Association of St. Louis has demonstrated that all-St. Louis locomotives can be built. It is constructing ten superswitchers in its shops at Brooklyn, Ill., a short distance south of East St. Louis. Henry Miller, president of the association, has intimated that hereafter his company will build all its engines in the district, and of materials produced in the district.

Bad Locomotives Increase

Washington, Dec. 7.—Class one railroads on Nov. 15 had 9460 locomotives in need of repair or 15.2 per cent of the number on line, according to the American Railway association. This was an increase of 860 compared with the number in need of repair Nov. 1, when there were 8654 or 13.9 per cent. Serviceable locomotives in storage Nov. 15 totaled 3841 compared with 4102 on Nov. 1.

Finished Rate Too High

Washington, Dec. 7.—The rate on steel plates and bars from Rankin, Pa., to Barnesville, O., has been found unreasonable by the interstate commerce commission and reparation has been awarded. This decision was rendered in the case of the Watt Mining Car Wheel Co. against the Baltimore & Ohio railroad.

Acquires Ohio Plant

Cleveland, Dec. 7.—The plant of the John F. Byers Machine Co., Ravenna, O., comprising gray iron, brass and aluminum foundries and pattern and machine shops, has been sold to Glenn P. Cowan of Detroit for $1,400,000.

Haselton Sets Record

Youngstown, O., Dec. 7.—All sheet production records at the Haselton plant of Sharon Steel Hoop Co. have been broken this year. The tonnage of the nine mills so far this year is higher than any previous year.

Still Selling Scrap

Officials of Hickman, Williams & Co. state that the iron and steel scrap departments of their offices in various cities will be conducted without change. Only in the New York office has this department been dropped.

Fletcher Is Elected

Pittsburgh, Dec. 7.—John S. Fletcher, assistant to the president of the Harbison-Walker Refractories Co., has been elected vice president to succeed the late Hamilton Stewart.

Morgan Vise Co., Chicago, has increased its capital from $10,000 to $25,000.

Pig Iron Market Is Quiet

(*Concluded from Page* 1509)

Coke & Iron Corp. for a local steelmaker. Total sales in November in this district approximated 42,000 tons, of which the local producer booked 35,000 tons. Inquiry is pending for about 2500 tons, including 1000 tons for an east side melter. Shipments continue on a liberal scale, and the melt is holding up well. Prices are nominally unchanged, but reports of small concessions are current.

Birmingham, Ala. Dec. 7.—Pig iron sales are at low ebb. Quotations remain firm at $20, base, Birmingham. Furnace interests are confident buying for first quarter will be underway soon. The Tennessee Coal Iron & Railroad Co., has blown out No. 6 Ensley furnace that was making basic iron.

Philadelphia, Dec. 7.—Pig iron demand is lighter than it has been in a long time. Total foundry sales are small and no demand for basic is evident. A large inquiry for low phosphorus which has been in the market for several weeks has been withdrawn. About 1500 tons of this grade of iron now is pending, including 200 tons for the Washington navy yard.

Colonial Iron Co. expects to blow out its blast furnace at Riddlesburg, Pa., before the end of December for relining.

Warehouse Trade Quiet

(*Concluded from Page* 1521)

year. The month developed few charges in prices and there was a notable absence of cutting.

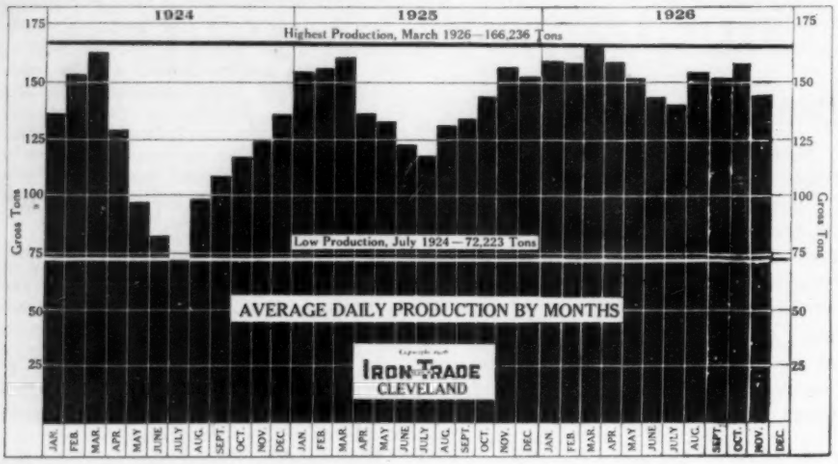
Approach of the holiday and inventory period has slackened demand warehouse products at Cincinnati. The movement of plates and reinforcing bars has been on a fairly large scale. Bars showed an increase of 20 per cent in November over the previous month.

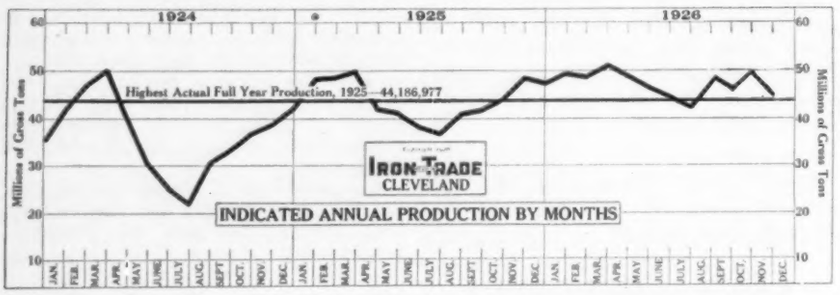
The Chicago warehouse market continues to slope gently downward, a natural situation for this time of year. In general the warehouse business in this territory has been good although November was below October. Rumors of mill disturbances in wire products have not affected the jobbing trade in these commodities.

Further decreases are noted in demand for iron and steel warehouse products at Detroit in keeping with the general decline in industrial activities. Continued fair volume of industrial and commercial construction is keeping up a fair demand for structurals.

Warehouses at Philadelphia now are paying for the heavy business done in recent months. November business was smaller than November, 1925, and December is not expected to equal last December. More foreign bars and shapes are being marketed at Philadelphia, affecting prices. Bars are being sold at 2.90c, Philadelphia. More shapes are being sold at 2.65c, whereas 2.75c has been the usual minimum. Considerable shading of cold strip out of the immediate district is reported, 6.00c being done, a reduction of 25 points.

November Ingots Suffer Drop





FOLLOWING a strong gain in October, steel ingot production made a sharp drop in November and reached a level for both total output and daily rate which was the lowest since July. With July representing the low point for the year, the November operations stand as second lowest. According to statistics compiled by the American Iron and Steel institute from figures reported by companies which in 1925 made 94.5 per cent of the country's total, the November production was 3,722,119 gross tons. Compared with the 4,092,548 tons of the previous month, this was a decrease of 370,429 tons. Both November and October were months of 26 working days. Production in July was 3,651,055 tons.

Average daily production in November was 143,158 tons per day, which against the 157,406-ton daily rate of the month before, was a loss of 14,248 tons, or 9.0 per cent. In July, operations were at the rate of 140,425 tons per day. On the basis of 143,158 tons per day and 311 days in the year, the indicated annual rate of production was 44,500,000 tons. For October, the indicated annual rate was 48,950,000 tons. Based upon the country's theoretical ingot capacity of 55,844,033 gross tons as of Dec. 31, 1925, operations in November represented 79.73 per cent, against 87.66 per cent in October.

For the 11 months of 1926, production totaled 43,661,517 tons, as compared with 40,169,820 tons during the corresponding period of 1925 and 44,140,738 tons for the full year. Daily production for this year has averaged 153,198 tons per day, against 141,932 tons last year. Operations for 1925 averaged 85.32 per cent of capacity.

Steel Ingot Production—1925-26

94.5 Per Cent of Industry Reporting

Gross Tons

	Open-hearth	Bessemer	All other	Monthly output companies reporting	Calculated monthly output all companies	No. of working days	Approximate daily output all companies	Change in daily rate per cent
1925								
Jan.	3,263,256	689,996	11,960	3,965,212	4,193,281	27	155,307	+13.1
Feb.	2,933,225	602,042	12,998	3,548,265	3,752,352	24	156,348	+ 0.6
Mar.	3,337,721	614,860	13,633	3,966,214	4,194,340	26	161,321	+ 3.1
Apr.	2,858,866	515,715	14,182	3,388,763	3,583,676	26	137,834	—14.5
May	2,755,561	497,708	13,790	3,267,059	3,454,971	26	132,883	— 3.6
June	2,540,729	476,945	12,490	3,030,164	3,204,451	26	123,248	— 7.2
July	2,446,068	457,095	13,547	2,916,710	3,084,472	26	118,634	— 3.7
Aug.	2,698,285	523,734	12,914	3,234,933	3,420,998	26	131,577	+10.9
Sept.	2,738,673	547,121	13,977	3,299,771	3,489,565	26	134,214	+ 2.0
Oct.	3,077,114	584,567	15,624	3,677,305	3,888,814	27	144,030	+ 7.3
Nov.	3,092,194	581,347	17,085	3,690,626	3,902,900	25	156,116	+ 8.4
11 mos.	31,741,692	6,091,130	152,200	37,985,022	40,169,820	285	140,946	.....
Dec.	3,169,796	569,304	15,843	3,754,943	3,970,918	26	152,728	— 2.1
Total	34,911,488	6,660,434	168,043	41,739,965	44,140,738	311	141,932	.....
1926								
Jan.	3,326,846	581,683	13,664	3,922,193	4,150,469	26	159,633	+ 4.5
Feb.	3,023,829	556,031	12,818	3,592,678	3,801,776	24	158,407	— 0.8
Mar.	3,590,791	635,680	15,031	4,241,502	4,488,362	27	166,236	+ 4.9
Apr.	3,282,435	601,037	13,652	3,897,124	4,123,941	26	158,613	— 4.5
May	3,201,230	516,676	10,437	3,728,343	3,945,336	26	151,744	— 4.3
June	3,036,162	498,764	9,441	3,544,367	3,750,653	26	144,256	— 4.9
July	2,911,375	526,500	12,372	3,450,247	3,651,055	26	140,425	— 2.6
Aug.	3,145,055	627,273	12,003	3,784,331	4,004,583	26	154,022	+ 9.7
Sept.	3,089,240	612,588	12,660	3,714,488	3,930 675	26	151,180	— 1.8
Oct.	3,224,584	630,526	12,348	3,867,458	4,092,548	26	157,406	+ 4.1
Nov	2,915,558	592,239	9,605	3,517,402	3,722,119	26	143,158	— 9.0
11 mos.	34,747,105	6,378,997	134,031	41,260,133	43,661,517	285	153,198	.....

Schwab Is Made Head of Mechanical Engineers

New York, Dec. 7.—With several hundred engineers attending, the annual meeting of the American Society of Mechanical Engineers was opened here today at the Engineering Societies building. Technical sessions were conducted in the morning and afternon, the afternoon meeting being followed by the Robert Henry Thurston lecture. In the evening the president's address and reception was held, at which time the John Fritz gold medal was awarded to Dr. Elmer A. Sperry. Charles M. Schwab, chairman of the board, Bethlehem Steel Corp., was inducted as the new president of the society.

The Robert Henry Thurston lecture was presented by Dr. Cecil Howard Lander, director, fuel research, department of scientific and industrial research, London. The subject was "Latest Discoveries in Chemistry of Coal," and covered research on the possibilities of new processes of distillation and recovery of by-products.

The John Fritz medal was awarded to Dr. Sperry for his contributions to engineering, involving more than 440 patents on inventions of unusual scope and importance.

The annual national exposition of power and mechanical engineering, comprising 500 exhibits, is being held concurrently with the convention at Grand Central Palace.

Reduce Accidents by Contests

Interest Maintained in Workers' Minds by Continuous Competition for Supremacy in Records—Safety Habit Is Aim Rather Than Simply Winning Prizes—How It Is Worked Out

By J. A. Voss

LAUNCHING a safety campaign does not entail much effort. But to keep that campaign going under high pressure continually, month after month, year after year, and to maintain interest long after the novelty of the initial effort has worn off, is not easy. As we must plan on making safety work a permanent factor in industry, we must plan on developing a will for safety in the worker.

Among the many ways of creating the safety spirit and one which has accomplished results is the safety contest. In this, it must be remembered, it is the safety spirit that should be developed, rather than victory in a contest. The rules of the contest should be drawn to develop the safety spirit rather than to appeal to various hobbies of workers. The real purpose of contests should be the awakening of every employe to the seriousness of personal responsibility and continual alertness for the prevention of accidents, thereby establishing and maintaining an enviable safety record on the accident chart.

The writer does not favor individual prizes in safety contests. The reward for such contests should be in the form of honor rolls. There is nothing more enviable for a foreman to strive for than a record of no serious injuries or deaths among the men under his jurisdiction, and such a record can be attained if the men in charge of work insist at all times that the work be done in a safe way.

Best Safety Device, a Careful Man

Guarding the dangerous machine to the utmost does not prevent accidents, and the making of a hazardous place safe does not eliminate injury. From the safety contest standpoint, therefore, we must work to create the will for safety in those hazardous places; and when we have placed in these jobs the best safety device known, a carful man, we shall have no more accidents.

Contests bring about a closer relation between the safety department and the superintendents, foremen and workmen, and assist greatly in keeping the subject of accident prevention uppermost in their minds. They are important factors in any well organized industrial safety organization. Industrial accidents can be avoided; not by keeping secret the accident and its results, but by giving the occurrence wide publicity in the plant. When contests are on a competitive basis they arouse a certain friendly rivalry, thereby creating great interest and enthusiasm. This can be followed by a letter of appreciation by the general manager to the department head with the best record, who should post the letter where it can be seen by all employes.

Departments in Competition

Another feature of our accident prevention work is based on departmental competition, where each department competes in the elimination of accidents. Such competition has injected an excellent spirit of team work which can only be secured through coordinated effort, rather than individual performance.

To encourage and keep alive the interest in this work, comparative ratings are published monthly, showing the number of days lost on account of accidents which are divided by the number of days worked, and the department having the best percentage is placed at the top of the safety report. This report also shows the rank of the various departments to date for the year, and their percentage for the year as compared with the same period of the previous year.

In one column of this report is shown the standing of the various departmental superintendents, and the superintendent heading the list at the close of the year is sent to the National Safety congress and all his expenses are paid by the company.

It is our opinion that these contests and reports furnished monthly to all department heads and posted in each department throughout our entire operations have been contributing factors in our successful accident prevention activities, because they have injected the spirit which comes only through the pride of accomplishment. No means offers itself so promptly to arouse this interest and continue it as does the placing of accident prevention on a competitive basis.

Only those accidents which result in one full day or more of lost time are counted for competitive rating purposes. All accidents are reported and studied to prevent a recurrence, but it was found necessary to base the rating only on those involving lost time, in order that there might be a standard for determining just what constituted an accident for rating purposes. If minor accidents are included in a competitive rating plan, there is always a tendency to avoid not reporting them and the fairness of the plan is thus jeopardized.

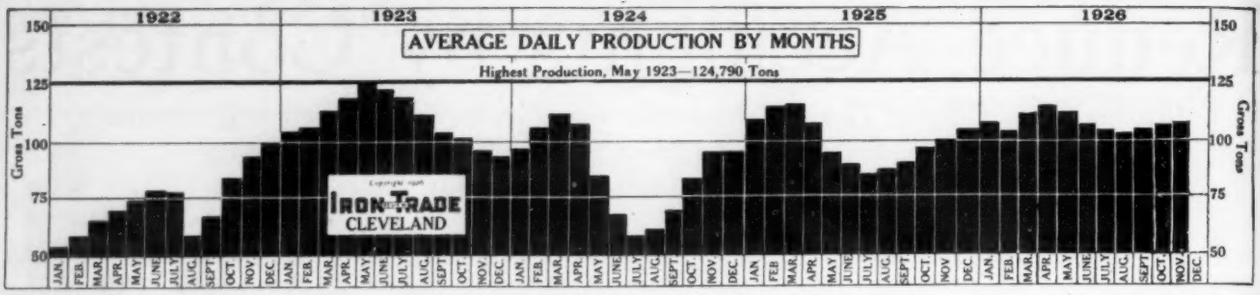
In any game of sport where the selection of the winner rests upon a score, the contestants themselves must understand and believe in the rating scheme or it will fail. In the establishment of rules governing a contest no special consideration should be given one contestant over another because of hazard. The mill that knows all its hazards can promote safety through the fact that it knows the dangers well, and it does not deserve special attention on that account.

The contest should be planned on the basis of individual carefulness alone under whatever conditions may exist, and each contest should lead us to a better set of rules than those used in previous contests. There should be a central body to make these rules. Each rule should be understood by each workman in every mill, and its reasonableness be shown to them. This is the only way that we shall obtain universal co-operation in safety contests with all that this means to the contestants.

Contests have been a great help in minimizing accidents, and therefore have become an important part of the accident prevention program.

Paper read at National Safety congress, Detroit, Oct. 25-30. The author is director, safety and compensation, Central Alloy Steel Corp., Massillon, O.

The Scovill Mfg. Co., manufacturers of brass goods and metal specialties, Waterbury, Conn., has increased its capitalization from $17,200,000 to $22,125,000.



November Ironmaking Rate Gains

FINAL figures on coke pig iron production for November closely checked the estimated output reported in the Dec. 2 issue of IRON TRADE REVIEW and showed that while the November total was somewhat lower than the October total, because of the shorter month, average daily production made a small increase over the rate of the preceding month. Both total output and daily rate were the highest for any November since 1918. Complete figures supplied by blast furnaces showed that on the last day of the month, the number of active furnaces was 216 against 218 on Oct. 31.

MONTHLY PRODUCTION

	1926	1925	1924
January	3,319,789	3,372,207	3,015,489
February	2,923,850	3,214,067	3,073,619
March	3,458,171	3,571,422	3,465,389
April	3,438,805	3,211,235	3,226,107
May	3,477,820	2,933,907	2,619,986
June	3,232,478	2,679,045	2,022,836
Total 1st half	19,850,913	18,981,883	17,423,417
July	3,224,663	2,665,262	1,783,457
August	3,200,723	2,707,171	1,882,986
September	3,163,269	2,726,885	2,053,617
October	3,334,206	3,017,889	2,461,727
November	3,237,992	3,023,257	2,154,970
December		3,249,057	2,956,389
Total 2nd half	16,160,853	17,388,521	13,653,155
Grand total	36,011,766	36,370,404	31,076,572

Active Blast Furnaces

	In blast	Total	Per Cent
November	216	374	57.7
October	218	373	58.5
September	216	371	58.2
August	215	372	57.8
July	217	372	58.4
June	220	372	59.1

Pig iron produced in November was 3,237,992 gross tons, which compared with the 3,334,206 tons of October was a loss of 96,214 tons. November, however, had but 30 days as compared with 31 in the preceding month. Average daily production was 107,933 tons and an increase of 378 tons over the 107,555-ton rate of the month before. This rate was the highest since last May when the country's furnaces were producing 112,187 tons per day. Both total output and daily rate were the highest for any November since November, 1918, when the total was 3,347,844 tons and the daily rate, 111,595 tons.

AVERAGE DAILY PRODUCTION

	1926	1925	1924	1923	1922
Jan.	107,089	108,781	97,273	104,136	53,090
Feb.	104,423	114,788	105,987	106,925	58,220
Mar.	111,554	115,207	111,787	113,664	65,674
Apr.	114,627	107,041	107,537	118,210	69,005
May	112,187	94,642	84,515	124,790	74,495
June	107,749	89,301	67,427	122,262	78,748
July	104,021	85,976	57,531	118,860	77,517
Aug.	103,249	87,328	60,741	111,254	58,408
Sept.	105,442	90,862	68,454	103,917	67,466
Oct.	107,555	97,351	79,419	101,375	84,827
Nov.	107,933	100,775	83,832	96,373	94,870
Dec.		104,808	95,367	93,952	99,468
Ave.	107,819	99,645	84,908	109,659	73,563

DIVISIONS OF PRODUCTION

1925	Merchant	Non-merchant	Spiegel	Ferro-manganese	Other ferro
Jan.	659,256	2,712,951	5,418	23,564	956
Feb.	661,415	2,552,652	4,910	19,796	848
Mar.	736,284	2,835,138	5,449	24,422	877
April	689,162	2,522,073	5,341	21,448	799
May	605,347	2,328,560	5,294	22,717	298
June	563,782	2,115,263	4,972	19,834	.....
July	609,741	2,055,521	5,074	16,614	.....
Aug.	588,330	2,118,841	4,940	18,818	.....
Sept.	569,219	2,156,666	5,162	18,381	140
Oct.	606,092	2,411,797	5,071	21,472	1,544
Nov.	638,214	2,385,043	6,370	27,202	1,665
Dec.	664,681	2,584,376	7,746	25,881	1,883
Total	7,591,523	28,778,881	65,747	260,149	9,010
1926					
Jan.	724,946	2,594,843	7,746	32,924	1,607
Feb.	622,121	2,301,729	7,084	22,309	1,464
March	733,321	2,724,850	7,339	24,064	1,942
April	779,310	2,659,495	7,051	24,134	1,593
May	797,539	2,680,281	6,990	22,979	1,704
June	734,823	2,497,655	5,864	25,378	.....
July	758,166	2,466,497	3,699	26,873	.....
Aug.	682,017	2,518,706	4,372	23,557	.....
Sept.	684,420	2,478,849	2,925	25,218	.....
Oct.	712,872	2,621,334	6,295	28,444	516
Nov.	710,362	2,527,630	7,565	31,903	.....

During the 11 months of 1926, pig iron production has amounted to 36,011,766 tons, as compared with 33,121,347 tons in the corresponding period of 1925, or 36,370,404 tons in the full year. Operations throughout 1926 have averaged 107,819 tons per day, against 99,645 tons last year.

Reports indicated that on the last day of November, 216 of the country's 374 serviceable blast furnaces were in operation, representing an activity of 57.7 per cent. On Oct. 31 the number of operating units was 218 out of a total of 373, or an activity of 58.5 per cent. The total of serviceable stacks was increased one on Nov. 21 by the blowing in of the new No. 2 furnace of the Weirton Steel Co., Weirton, W. Va. Of the merchant class, 2 furnaces were blown in and 3 blown out or banked. Of the nonmerchant class 4 were blown in and 5 blown out.

Spiegeleisen made in November was

NOVEMBER PIG IRON

	No. of stacks	No. in blast last day of month Nov.	Oct.	Total tonnage made Merchant	Nonmerchant	—Totals— Nov.	Oct.
Ohio	70	49	50	172,548	619,222	791,770	810,199
Pennsylvania	130	74	74	124,333	945,796	1,070,129	1,135,385
Alabama	34	22	23	113,500	161,080	274,580	249,409
Virginia	17	2	2	7,210	.....	7,210	7,503
New York	26	16	15	96,153	108,811	204,964	213,224
New Jersey	3	0	0	.....	.....	.....	.....
Illinois	26	16	18	109,906	191,001	300,907	327,152
Colorado	5	3	3				
Indiana	18	14	14	13,635	377,476	391,111	409,886
Maryland	6	6	5				
Wisconsin	5	1	2				
Kentucky	5	1	1				
Massachusetts	1	1	1				
Tennessee	13	1	1	26,166	52,553	78,719	71,265
Utah	1	1	1				
West Virginia	5	3	2				
Michigan	4	4	4				
Minnesota	3	2	2	34,783	44,351	79,134	74,928
Missouri	1	0	0				
Texas	1	0	0				
Spiegel and ferro—all states	....	....	....	12,128	27,340	39,468	35,255
Total	374	216	218	710,362	2,527,630	3,237,992	3,334,206

7565 tons, against 6295 tons in October and was the highest since the 7746 tons of last January. Ferromanganese, with 31,903 tons compared with 28,444 tons in October, and likewise was the highest for any month since last January when 32,924 tons was made.

Stacks blown in during November were: In Pennsylvania: One Bethlehem, Bethlehem Steel Co.; Clinton Clinton Iron & Steel Co.; one Carrie, Carnegie Steel Co. In New York: Standish, Chateaugay Ore & Iron Co. In Maryland: Maryland E, Bethlehem Steel Co. In West Virginia: the new Weirton No. 2, Weirton Steel Co.

Stacks blown out during the month were: In Ohio: One Ohio, Carnegie Steel Co. In Pennsylvania: one Duquesne, Carnegie Steel Co.; Punxy, Punxsutawney Furnace Co., Claire, Edmund W. Mudge & Co. In Alabama: Ensley No. 6, Tennessee Coal, Iron & Railroad Co. In Wisconsin: Thomas, Thomas Furnace Co. In Illinois: South Works Nos. 1 and 10, Illinois Steel Co.

Hobart Stock on Market

Hobart Mfg. Co., Troy, O., which has been a closely held corporation, will be more widely owned as the result of sale of about 30 per cent of its stock and some treasury stock by those who have held it previously. The stock has been taken over by a syndicate composed of the First Investment & Securities Corp., Cincinnati, Redmond & Co., New York, W. E. Hutton & Co., Cincinnati, and New York, and Marshall Field, Glore, Ward & Co., Chicago. The stock will be offered the public shortly by this syndicate.

Control of the company will remain in the same hands as heretofore. The company manufactures electric food-preparing machines, coffee mills, sausage grinders, mixers and cutters. The assets of the Crescent Washing Machine Co., New Rochelle, N. Y., were acquired recently and the sale of treasury stock is to finance this addition.

Visions Largest Works

In a decade the Bethlehem Steel Co.'s plant at Sparrows Point, Md., will be the largest steel plant in the world, said Charles M. Schwab, chairman of the Bethlehem company, in a recent address before the Baltimore association of commerce. It is understood this refers to gradual expansion and not any project immediately in hand. Two million dollars will be spent on the dry dock recently purchased at Baltimore, said Mr. Schwab.

Basic open-hearth steel first was made in the United States at Cleveland in 1866.

Vessels Released

Weather Moderates, Great Ice Blockade in St. Mary's River Clearing

Cleveland, Dec. 7.—Reports received late Tuesday by Cleveland vessel interests indicated that the greatest ice blockade in the history of Great Lakes navigation will soon be a matter of the past. The weather is moderating and the temperature at Sault Ste. Marie Tuesday morning was 28 degrees above zero, compared with 5 to 10 degrees below when the steamers were caught in the ice of St. Mary's river.

The first of the vessels were caught in the ice in West Neebish channel and in Middle Neebish channel a week ago, and 121 were soon in the blockade, either fast in the ice in the two channels, or anchored, being unable to go forward or back up.

West Neebish channel is used by the downbound boats and Middle Neebish channel is taken by those going north, these channels being narrow passageways on either side of Neebish island, half way between Lake Huron and Lake Superior.

The steel car ferry SAINTE MARIE and a score of tugs were sent to the rescue of the fleet but weather conditions were unfavorable until Monday afternoon when the first ten of the upbound boats in Middle Neebish channel were released. Early Tuesday morning two more in that channel were able to get away, and at noon a message was received by shipping interests in Cleveland that all of the remaining nine boats in the upbound channel were proceeding slowly on their way toward the Soo and Lake Superior. Thirty-five other vessels upbound had been anchored in Mud lake, south of Neebish island, and it was assumed that all of these were able to follow through the channel.

The majority of the steamers held up were blockade in the downbound channel or anchored in Hay lake, north of the channel. The first in line of the downbound boats, the COULEE, a small steamer was wedged sideways in the channel ice. The message Tuesday noon stated that this "key boat" was released Tuesday morning, and that the tugs were turning their attention to the steamer GARRETSON, next in line, and the steamer WILLIAM G. MATHER, following the GARRETSON. With a continuation of favorable weather vessel operators believed that the downbound channel would be cleared Tuesday or Wednesday.

The downbound steamers carried 14,000,000 bushels of grain, and those upbound had on board 375,000 tons of cargo coal. Not all of them had cargoes and there was some fear that those without coal cargoes would be unable to obtain sufficient supplies to keep up steam and get to port, The steamers and their cargoes were estimated to represent a value of $60,000,000 to $75,000,000.

The Lake shipping season has been fraught with more than the usual December perils this year. The steamer CITY OF BANGOR, owned by the Nicholson & Co., Detroit, loaded with automobiles for Duluth, and the steamer THOMAS MAYTHEM, General Transit Co., Cleveland, laden with wheat for Buffalo, were driven on the rocks off Keweenaw Point, Lake Superior, while the collier J. L. REISS, with 9000 tons of coal, sank after crashing into a pier at Sheboygan, Wis.

Great Lakes steamers carry 105,000,000 tons of cargo freight in a season and usually there is a considerable movement of grain and iron ore in December.

Final Hearing Ordered on Pig Iron Rates

A hearing involving freight rates on pig iron in Ohio, Indiana and other points in central freight association territory will be held before examiners for the interstate commerce commission at 1 p. m. Dec. 13 at the Great Northern hotel, Chicago. The hearing is an upshot of freight reductions that were announced last January by several Ohio railroads, and which spread into Kentucky, Michigan and Indiana, leading to a tangle in the rate fabric. The commerce commission suspended all rates temporarily and then suspended them to Nov. 1. Last week the commission again suspended them to March 1, and ordered a hearing with a view to final action.

Two Cleveland blast furnace interests protested the rate orders that were made by the railroads effecting rates between Cleveland and Canton and Mahoning valley points and Canton. They and two Chicago blast furnace interests are among the group that will be heard.

Bar Rate Found Unjust

Washington, Dec. 7.—Rates charged on steel bars, in carloads, from Massillon, O., to Swissvale, Pa., have been found unreasonable by the interstate commerce commission and reparation has been awarded. This decision was rendered in the case of the Central Steel Co. against the Pennsylvania railroad.

Industrial Men in the Day's News

E. A. Sperry, Awarded John Fritz Gold Medal for Engineering Contributions

OVER 400 patents have been granted him for inventions of diversified character rendering invaluable service today in many different fields.

IN RECOGNITION of the importance and scope of his inventions he has been awarded the highest honor possible by the engineering profession.

NO HOURS are too long and no personal sacrifice is too great when he visualizes a problem which he seeks to solve, but with it all he is intensely human in friendship and loyalty to home and country.

THE ability to invent is a faculty that cannot be acquired, according to Elmer Ambrose Sperry. He believes that a man either is born or is not born an inventor. He remembers his childhood, and how his keenness for wheels proved quite a nuisance to other members of the household.

He was interested in the various activities of the boys in his home town but in a different way. For instance, when it came to baseball, young Sperry was more interested in the implements used in the game than in the game itself. He wormed his way into the good-will of a couple of machine shop owners and he would use their lathes for turning up bats. He would play with a bat for a couple of innings and then go back and try to turn up a better one. His interest primarily was in evolving something new or something better than previously had existed. If it was not baseball bats it was something else.

The instinct which thus was expended in his boyhood on such things as baseball bats, has reached its fruition in the years since in a catalog of discoveries which has earned for Mr. Sperry recognition as one of the greatest of living inventors. More than 400 patents have been taken out by him. It is because of the importance and scope of his inventions that the greatest honor of the engineering profession in the United States recently has been bestowed upon him. This is the John Fritz gold medal, which formally was presented to Mr. Sperry on Dec. 7.

Born at Cortland, N. Y., in 1860, Mr. Sperry was educated at the state normal school at Cortland and at Cornell university where he spent a single year, 1879-80. In 1879 he made his first real invention, an arc light. In 1880, while still a youth of 20, he founded the Sperry Electric Co., Chicago, and manufactured arc lamps, dynamos, motors and other electrical appliances. It was in 1883 that he erected on Lake Michigan the highest electrical beacon in the world. As a result of entering a competition in 1888, Mr. Sperry produced the first electrical mining machinery.

Turning his attention to another field, Mr. Sperry organized the Sperry Electric Railway Co., Cleveland, to manufacture cars of his design, and he conducted this business with success until 1894, when his patents were purchased by the General Electric Co. Mr. Sperry also turned his attention to electric motor vehicles and he designed a successful electric carriage which he manufactured for several years. In 1896 he drove the first American built automobile in Paris.

About 30 years ago, Mr. Sperry became interested in the gyroscope and concluded that it could be utilized as a high precision compass. As a result, he produced his first successful gyro-compass. Further experiments with the gyroscope yielded the gyro-pilot for the automatic steering of ships. Mr. Sperry also applied the gyroscope toward the stabilization of ships.

In late years, Mr. Sperry has devoted further attention to arc lights and about 11 years ago perfected his high intensity arc searchlight.

Some 30 years ago, Mr. Sperry produced his first compound internal combustion engine. His greatest achievement in this field is his compound diesel engine which consumes fuel oil of the lowest grade.

Numerous highly scientific inventions have been made by Mr. Sperry for the United States government. These include gun fire control apparatus, sighting devices, stabilized cameras, and electrically sustained gyroscopes

for torpedoes. He is an active member of the Naval Consulting board.

Mr. Sperry is a charter member and founder of the American Institute of Electrical Engineers, the American Electrochemical society, and the National Electric Light association, a fellow of the National Academy of Sciences, a member of the Alpha Chapter of the Society of the Sigma Xi, a member of the American Society of Mechanical Engineers, American Chemical society, Society of Naval Architects and Marine Engineers, Society of Automotive Engineers, American Physical society, New York Electrical society, American Petroleum institute, Edison Pioneers and Japan society. He is also an honorary member of two Japanese engineering societies: the Society of Mechanical Engineers and the Society of Naval Architects. His clubs are the Engineers', Army and Navy, Engineers' Golf and Country, Suffolk County Golf and Country, Hamilton club and the Garden City Golf club. He has been honored with the degrees of doctor of engineering by Stevens Institute of Technology, and Doctor of Science by Northwestern university.

Untiring energy has spurred on Mr. Sperry all through his career. No hours are too long and no personal sacrifice too great when he visualizes a problem which he seeks to solve. Despite the intensity that characterizes Mr. Sperry in his research work, he is an absolutely human man. He is warm-hearted and loyal and, despite his labors, has had time to form many fine friendships. He is especially enthusiastic in supporting movements that have to do with the encouragement of aviation in this country.

For many years a resident of Brooklyn, Mr. Sperry is known for his hearty participation in movements affecting the welfare of the community. Recently he built a fine residence at Bellport, Long Island, where he now resides. His principal recreation is golf.

Mr. Sperry was decorated by the late Czar Nicholas of Russia for contributions to the science of navigation. In 1922 he received the Order of the Rising Sun from the Emperor of Japan.

Mr. Sperry also made several important inventions in the field of aerodynamics. The Aero club of France, in 1914, awarded him first prize for his airplane stabilizer which is an automatic pilot. Mr. Sperry invented the drift indicator and many other aerial flight instruments, in recognition of which the Collier trophy was awarded to him in 1918. It was Mr. Sperry who produced the world's highest speed wheels, which were installed in Mt. Wilson. They travel in either direction at a speed of 46,000 revolutions per minute and are employed in a study of the exact length of the astronomer's light year.

Men of Industry

Personal News of a Business Character Pertaining to the Iron and Steel and Related Fields of Enterprise

RALPH R. BROWNING has been elected president of the J. B. Colt Co., a subsidiary of the Union Carbide & Carbon Corp., New York. Mr. Browning continues as president of the Oxweld Acetylene Co. and the Union Carbide Sales Co. and as an officer of a number of other Carbide & Carbon subsidiaries.

* * *

Edgar S. Bloom, president of the Western Electric Co., has been elected a director of the Chatham & Phenix National Bank & Trust Co.

* * *

Walter L. Mulligan has been elected president of the United Electric Light Co., Springfield, Mass., to succeed Robert W. Day.

* * *

J. B. Smiley has been elected president of the Remington Arms Co., Bridgeport, Conn., to succeed C. L. Reierson.

* * *

George Hannauer of Chicago has been elected president of the Boston & Maine railroad with headquarters at Boston. Mr. Hannauer has recently been vice president and general manager of the system of Chicago Terminal railroads. Mr. Hannauer will take office Jan. 1.

* * *

John Udell, treasurer of the Muncie Malleable Foundry Co., Muncie, Ind., was elected a vice president of the Muncie chamber of commerce.

* * *

Stanley C. Hope has been elected second vice president of Gilbert & Barger Co., Springfield, Mass., manufacturer of gasoline tanks and pumps. This office was newly created for Mr. Hope.

* * *

Robert E. Friend, president of the Nordberg Mfg. Co., Milwaukee, has been elected a director of the National Exchange Bank of Milwaukee, to fill a vacancy. He entered the Nordberg company upon his graduation from Cornell university in 1908, and was elected president in 1921.

* * *

Henry E. Aldrich has been appointed general manager of the Wickes Boiler Co. with headquarters in Saginaw, Mich.

J. Robert Fortune has been made general sales manager of the Wickes company with headquarters in the General Motors building, Detroit.

Louis J. Desparois has been made manager of the equipment plant of the American Radiator Co., Buffalo. Mr. Desparois has been in the service of the company for 34 years. He was manager of the branch at Kansas City for six years prior to his recent appointment.

J. F. Groebe succeeds Mr. Desparois at Kansas City.

* * *

Robert J. Wilson of Duluth, Minn., has been elected president of the Kempsmith Mfg. Co., Milwaukee, builder of milling machines, effective Dec. 1. Mr. Wilson formerly was vice president and general manager of the Western Steel Products Co., and chairman of the board of the Western Furnace Co., affiliated with the Marshall-Wells Co., Duluth, and is a past president of the National Corrugated Metal Culvert association. He is a graduate of Lawrence college, Appleton, Wis.

* * *

I. Edmund Waechter, formerly metallurgical engineer, General Chemical Co., New York, now is engaged in consulting metallurgical and chemical engineering practice at Tampa, Fla. He was graduated from Harvard universi-

ty and received the degree of metallurgical engineer from the Massachusetts Institute of Technology in 1917. Mr. Waechter was metallurgical engineer for the Standard Tool Co., Cleveland; electric furnace melter for the Crucible Steel Casting Co., Cleveland, and metallurgical engineer with the Cleveland Hardware Co., Cleveland. He was works manager and secretary-treasurer also of the Baker-Waechter Co., Cleveland, and metallurgical engineer for the Brown & Sharpe Mfg. Co., Providence, R. I.

* * *

Frank L. Estep of Perin & Marshall, New York, has returned from Europe.

* * *

Roland C. Lea, of Robert C. Lea & Co., Stephen Girard building, Philadelphia, has left America for a stay in Algiers.

* * *

W. M. Bastable, until recently general sales manager of the Wilson Welder & Metals Co., New York, has been appointed manager of the New York office of the Electric Welder Controller Co., Pittsburgh, with offices at 29 Courtlandt street, that city.

* * *

R. I. Tindal has been appointed purchasing agent of the Nickel Plate road, the New York, Chicago & St. Louis Railroad Co., Cleveland, effective Dec. 1. He succeeds W. P. Dittoe who retired after filling that office for 27 years, and after serving 45 years with the company.

* * *

Albert J. Woodruff, president of the Woodruff Machinery Co., Atlanta, manufacturer and distributor of machinery and parts recently was elected a member of the Georgia Public Service commission. Mr. Woodruff formerly was a member of the Georgia State legislature.

* * *

George M. Dyke, assistant secretary of the Chain Belt Co., Milwaukee, has resigned from that connection to become a director and treasurer of the Stearns Conveyor Co., Cleveland, recently acquired by the Chain Belt Co. Earl D. Stearns is president of the Stearns company.

* * *

Charles H. Brandt, recently elected persident of the Steel and Iron Contractors' association, Cleveland, is president of the National Iron & Wire Co. of that city. Other officers are A. H. Marty, first vice president; E. F. Hauserman, second vice president; James Hill, secretary; H. J. Romans, treasurer and W. P. Carroll, executive secretary.

* * *

William M. Rule has been appointed general manager of the Michigan Copper & Brass Co., Detroit, succeeding the late A. B. Seelig, general manager from 1919 until his death a a few months ago. Mr. Rule became associated with the Michigan company as treasurer in 1919.

* * *

Burton L. Delack, assistant manager of the Erie, Pa., works of the General Electric Co., has been appointed assistant manager of the works at Schenectady, N. Y., effective Dec. 1.

John St. Lawrence, general superintendent at Erie, has been named to succeed Mr. Delack there.

* * *

T. A. Clark has resigned as general manager in charge of sales and production and also as secretary-treasurer of the Standard Engineering Co., Ellwood City, Pa., effective Jan. 1. His resignation marks the culmination of a long career with the Standard company, having been affiliated with the company 20 years.

* * *

Henry E. Aldrich has been appointed general manager of the Wickes Boiler Co. with headquarters at Saginaw, Mich.

J. Robert Fortune has been made general sales manager of the Wickes Co. with headquarters in the General Motors building, Detroit, which will be the main offices of the company after Jan. 1.

* * *

J. J. Gilmore has been appointed as general sales manager for the Birmingham, Ala., district of the American Steel & Wire Co., Cleveland. The territory has been expanded to include Alabama, Mississippi and Louisiana. Mr. Gilmore has for some time been indentified with the Birmingham offices, which are located in the Brown-Marx building.

* * *

Mefford R. Runyon, recently appointed district sales manager for the New York metropolitan district for the Bridgeport Brass Co., Bridgeport, Conn., formerly was with the Benson Rolling Mills. He was graduated from Rutgers college, and entered the wholesale hardware business. After four years he associated with the Benson Rolling Mills.

* * *

Orrin H. Baker has been appointed assistant manager of sales in charge of the rail division of the general sales department, Illinois Steel Co., Chicago, to succeed the late P. W. O'Brien.

William I. Howland Jr. has been appointed assistant general manager of sales in charge of the bar division of the general sales department, according to official announcement. Mr. Howland succeeds B. E. Hamilton, who died several weeks ago, and his appointment also is effective as of Dec. 1. Both Mr. Baker and Mr. Howland are to be assistants to Edwin S. Mills, vice president and general manager of sales.

Mr. Baker is a graduate of the University of Illinois, having obtained his degree in mechanical engineering in 1907. He joined the Illinois Steel Co. that year and spent five years in the engineering and chemical departments of the plants. He has been connected with the sales department since 1912 in various capacities.

Mr. Howland is a graduate of the Sheffield scientific school, Yale university, with a degree in mechanical engineering. His connection with the Illinois Steel Co. began in September, 1908, the year of his graduation. He was in the operating department of the electric furnace unit until 1914, part of that time as superintendent of the electric furnace. From 1914 to 1917 he was salesman of alloy and electric steel. From 1917 to 1919 Mr. Howland was with the navy department in war work. Since 1919 he has been a salesman and also assistant to the late Mr. Hamilton.

* * *

G. M. Eaton, chief mechanical engineer of the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has joined the sales engineering forces of the Molybdenum Corp. of America, effective Dec. 10. Mr. Eaton had been with the Westinghouse company for 20 years. He was graduated by the Worcester Polytechnic institute. He joined the Westinghouse company in 1906 after serving for some years with the Newport News Shipbuilding & Dry Dock Co. and the Union Iron Works, San Francisco. In 1919 Mr. Eaton was made chief mechanical engineer of the Westinghouse company. A large number of inventions are accredited to Mr. Eaton. In his new work, Mr. Eaton will be principally interested in the development of the use of alloy steel in the railway and industrial fields. He will continue a curtailed association with the Westinghouse company, serving in the capacity of consultant on mechanical engineering problems.

British Steel Trade Is Reviving

Blast Furnaces and Steelworks Resume Operations—New Year Appears To Offer Exceptionally Active Business—French Automobile Industry on Shorter Week—Czech Producers Represented at Meeting of Steel Entente

European Headquarters,
IRON TRADE REVIEW,
2-3 Caxton House, Westminster, S. W.1

LONDON, Dec. 7.—(*By Radio*)—Coal miners' unions in all districts now have accepted the owners' terms. This includes South Wales where an eight-hour day is put in effect. Production is increasing daily, prices are easier, but a shortage of cars is causing congestion. Bunker coal is being released to ships, but export cargoes are subject to special license.

The iron and steel industry that has been crippled by the coal strike since May is gradually resuming operations. Dorman, Long & Co. hope to relight six blast furnaces this week.

Small shipments of pig iron from Middlesbrough have been resumed, at a total of 1141 being noted in a current report. Middlesbrough foundry iron is offered at £4 2s 6d ($20) on six-months' contracts. Production in some districts, especially in Barrow, is expected to exceed the output prior to the coal strike. Business in the coming year promises to be exceptionally active for British iron and steelmakers.

A slowing down of the steel industry in France is reported due to the increase in the value of the franc. Fewer hours daily and in some instances a shorter week are announced by automobile manufacturers. Export orders have decreased. Business in Belgium also shows some recession.

European steelmakers will meet in Paris, Dec. 10 to discuss further details of their entente. Czech producers will be represented with a possible quota of 1,500,000 tons of steel.

European Steel Makers Prosper

23 Rue de la Bienfaisance
Office of IRON TRADE REVIEW,

PARIS, Nov. 25.—(*European Staff Service*)—The steel entente has increased the tonnage distribution base for the last quarter of 1926 from 27,287,000 tons to 29,287,000 tons. No better proof can be cited as an indication of the activity of European markets. Anticipated increases in the cost of fuel, particularly coke, offset any hopes of an immediate reduction in iron and steel prices which otherwise might be expected in view of the continued improvement of the franc. German cokeries are enjoying a brisk market due to the English coal stoppage and it is reported that a price advance of 3.00 marks per ton is imminent.

Franc—$0.033

Export inquiry for steel products is heavy. Prices are firm and profitable. Basic bessemer blooms are quoted at £5 ($24.25), billets £5 6s ($25.69), sheet bars £5 11s ($26.89), structural shapes £5 12s ($27.13) and merchant bars £5 15s ($28.09), all f.o.b. Antwerp. German mills are offering bars at £5 16s to £5 17s ($28.09 to $28.33) f.o.b. Rotterdam or Amsterdam. Egypt has placed an order for 4898 tons of grooved tramway rails with a French mill. Another order for rails amounting to nearly $1,000,000 has been placed by South

Current Iron and Steel Prices of Europe

Dollars at Rates of Exchange, Dec. 6	*British* Gross Tons U. K. Ports		*French* Metric Tons Channel Ports		*Belgium and Luxemburg* Metric Tons Channel Ports		*German* Metric Tons Rotterdam or North Sea Port	
Export Prices f. o. b. Ship at Port of Dispatch—By Cable								
PIG IRON		£ s d		£ s d		£ s d		£ s d
Foundry No. 3, Silicon 2.50-3.00	$27.89	5 15 0*	$20.61	4 5 0	$20.61	4 5 0	$20.61	4 5 0
Basic	25.46	5 5 0	21.58	4 9 0	21.58	4 9 0	20.61	4 5 0
Basic-bessemer	24.25	5 0 0†	18.19	3 15 0	18.19	3 15 0	18.19	3 15 0
Hematite, Phosphorus 0.02-0.05	26.07	5 7 6	29.08	740*	.....	.....	21.34	4 8 0
SEMIFINISHED STEEL								
Billets	$32.74	6 15 0	$25.71	5 6 0	$25.71	5 6 0	$25.46	5 5 0
Wire rods	43.65	9 0 0	29.71	6 2 6	29.71	6 2 6	29.71	6 2 6
FINISHED STEEL								
Standard rails	$37.58	7 15 0	$29.10	6 0 0	$29.10	6 0 0	$29.10	6 0 0
Merchant bars	1.73c	8 0 0	1.22c	5 11 0	1.22c	5 11 0	1.32c	6 0 0
Structural shapes	1.46c	6 15 0	1.21c	5 10 6	1.21c	5 10 6	1.29c	5 17 0
Plates, ship, bridge and tank	1.68c	7 15 0	1.40c	6 7 6	1.40c	6 7 6	1.54c	7 0 0
Sheets, black, 24 gage	2.38c	11 0 0	2.53c	11 10 0	2.53c	11 10 0	2.42c	11 0 0
Sheets, galvanized, 24 gage, corrugated	3.73c	17 5 0	5.04c	2,800*	6.53c	3,900*	3.74c	17 0 0
Bands and strips	2.38c	11 0 0	1.51c	6 17 6	1.51c	6 17 6	1.54c	7 0 0
Plain wire, base	2.11c	9 15 0	1.57c	7 2 6	1.57c	7 2 6	1.54c	7 0 0
Galvanized wire, base	2.76c	12 15 0	2.04c	9 5 0	2.04c	9 5 0	1.93c	8 15 0
Wire nails, base	2.06c	9 10 0	1.73c	7 17 6	1.73c	7 17 6	1.67c	7 12 0
Tin plate, base box 108 pounds	$ 5.70	1 3 6	.....	.....	.....	.....	$ 6.79	1 8 0

*Francs

Domestic Prices at Works or Furnace—Last Reported			Francs		Francs		Marks	
Foundry No. 3 Pig Iron, Silicon 2.50—3.00	$29.10	6 0 0	$23.58	600(2)	$26.46	675	$19.55	85
Basic pig iron	25.46	5 5 0	23.19	590(1)	25.48	650	20.24	88
Furnace coke	13.34	2 15 0	7.62	194	9.02	230	4.95	21.50
Billets	32.74	6 15 0	32.03	815	31.36	800	27.49	119.50
Standard rails	1.84c	8 10 0	1.62c	900	1.70c	1,000	1.46c	140
Merchant bars	1.89c	8 15 0	1.58c	880	1.74c	1,025	1.40c	134
Shapes	1.68c	7 15 0	1.51c	840	1.70c	1,000	1.37c	131
Plates, ship, bridge and tank	1.89c	8 15 0	1.76c	980	1.96c	1,150	1.55c	149
Sheets, black, 24 gage	2.49c	11 10 0	3.20c	1,775	3.57c	2,100	2.35c	225
Sheets, galvanized 24 gage, corrugated	3.84c	17 15 0	4.95c	2,750	6.63c	3,900	3.65c	350
Plain wire	2.11c	9 15 0	2.97c	1,650	2.72c	1,600	2.03c	195
Bands and Strips	2.49c	11 10 0	2.07c	1,150	2.13c	1,250	1.62c	155

*Middlesbrough; †Scotch foundry iron; (1) Basic-bessemer; (2) Longwy. British export furnace coke £2 0s 0d ($9.70) f. o. b. Ferromanganese £16 0s 0d ($77.60) f. o. b. German ferromanganese £15 10s 0d ($75.18) f. o. b.

The equivalent prices in American currency are in dollars per ton for pig iron, coke, semi-finished steel and rails; finished steel is quoted in cents per pound and tin plate in dollars per box. British quotations are for basic open-hearth steel; French, Belgian, Luxemburg, and German are for basic-bessemer steel.

African railways. The Egyptian State railways have divided an order for 100,000 steel crossties between the Acieries de Micheville and de Wendel.

The domestic market is quiet. Jobbers in the Paris region have reduced the price of bars to 1140 francs ($37.62) out of warehouse. Mills are asking 900 francs ($29.70), but this figure is being shaded on attractive specifications.

French and Belgian manufacturers of wire rods are negotiating in view of fixing a uniform price f.o.b. Antwerp. Competition has been disbeen disastrous for all concerned and astrous for all concerned and an attempt will be made to advance the price at once to £6 15s ($32.70) per metric ton f.o.b. Antwerp, which is an increase of £1 ($4.85) over the old price. Saar mills are competing for wire rod business in France and have forced the domestic price down to 900 francs ($29.70).

Rumors are circulating on the continent to the effect that British iron and steel manufacturers are contemplating admission to the European steel entente.

German Exports Show Loss in September

Berlin, Nov. 24.—(*European Staff Service*)—Germany's exports of iron and steel products for September showed a decrease of 9910 metric tons compared with the exports of the preceding month. Exports in September were 451,908 metric tons, compared with 461,818 tons in August, 466,680 tons in July and 391,172 tons in January. The figure for September is nearly 144,000 tons above that for September 1925, when exports were 308,040 tons. Exports for the first nine months of this year amount to 3,888,628 metric tons compared with 2,502,542 metric tons for the same months of 1925.

Puddling on basic bottom using basic fluxes and slags was the invention of Hall in 1830.

German Output Grows Steadily

BERLIN, Nov. 24.—(*European Staff Service*)—Recently Director Poenssen of the United Steel Works Co. declared that no further increase in export prices for the present is being anticipated, and that domestic prices for December are expected to remain unchanged. Effects of the formation of the European steel entente already are favorable as foreign prices have been raised about 15 per cent, with the result that the export rebate paid to the German transforming industries can be cancelled. German producers now are busy. The Thyssen rolling mills of the United Steel Works Co. are rolling 145,000 tons of products per month, which equals the whole output of Italy and half that of Belgium. A further enlargement of the capacity of the Thyssen plant now is under way. A similar favorable statement has been issued by the Hoesch combine, which reports that most of its works operate at full capacity, but it points out that additional social burdens might destroy the foundation of the present strong position of the steel industry. Dec. 10 negotiations for the admission of the Austrian steel works to the entente will be resumed in Paris, and it is also hoped that at the next meeting of the European rail association Germany will finally become a member of this syndicate.

It is expected the German Raw Steel association will maintain its output for December at 80 per cent of capacity. Orders booked continue satisfactory, and domestic orders, especially from South Germany, are being received as the periods of delivery of producers in the Saar, Lorraine and Luxemburg are longer than those of their German competitors. An order particularly worth mentioning is that awarded by the Reich railroad for 800,000 metric tons of rails and railroad material for the permanent way. It is understood that the average price is 133 marks ($31.50) per ton, the order to be delivered by April next. Demand for building purposes has slackened, as is usual at this time of year, but machine makers have displayed more interest.

There is good demand for sheets, and plates also are in demand owing to better occupation of shipyards.

On the export market demand is smaller, since consumers seem to expect a reduction in prices as soon as Great Britain has resumed work. Inquiries for plates have been received from England, Holland and Japan. The interest for wire, especially galvanized wire, is dull, but wiremakers still are occupied and barbed wire is in demand. Prices of wire rods have been raised to £6 2s ($29.60). Exports of pipe to South Africa are handicapped because the country maintains its 100 per cent increase of duties on German goods. Prices of pipe for export have not been altered.

Pig iron output was advanced to 935,279 metric tons in October, owing to the blowing in of seven additional furnaces. This output now exceeds the prewar rate. The Borsig works intends to blow in another furnace and the Upper Silesian Julien-Hutte will do likewise. Demand for pig iron for domestic purposes has increased due to the growing shortage of scrap. This shortage has caused the principal western iron producers to unite for the joint purchase of scrap.

British Commerce Shows Strike Effect

Birmingham, Eng., Nov. 25.—(*European Staff Service*)—British board of trade's return for October shows a total export of iron and steel products, including scrap, of 196,597 tons, compared with 162,437 tons in September and 378,286 tons in October last year.

Imports, including scrap, amounted to 406,871 tons compared with 456,536 tons in September and 225,213 tons in October last year.

In exports the shipment of forge and foundry iron amounting to 3639 tons compares with 5820 tons in September and 36,324 tons in October last year. Large reductions are indicated in other classes of pig iron. The export of 9665 tons of bars, rods, etc. approximates closely to the September figure, but is only rather more than a third of last year's tonnage. Steel girders, etc. amounted to 1596 tons, about the same as September, but comparing with 9508 tons in October last year. Heavy reductions are shown in plates and sheets, and one of the poorest items is railway rails totaling 2299 tons, against 18,373 tons a year ago. One of the best totals is galvanized sheets, of which 59,614 tons were shipped against 66,572 tons in October last year. The figure is about 18,000 better than that of September. The United States of America, which a year ago bought 21,659 tons of pig iron received none this year, ferroalloys being represented by 119 tons against 1804 a year ago.

The story of the coal strike is written more deeply on the import side o fthe tables, enormous increases being registered in forge and foundry pig iron of which we received 45,298 tons against 7508 tons a year ago, basic pig iron 12,170 tons against 7561 tons. Steel blooms and billets are slightly lower than in September, but reached the total of 90,048 tons approximately double that of a year ago. For the ten months, these classes of unfinished steel make the heaviest showing, the total received being 675,512 against 541,917 tons in the same period last year. Another striking total is steel bars, 86,360 tons, also a slight decrease on September. Such constructional steel as girders, beams, etc. show large tonnages, and plates and sheets at 32,864 tons are more than double a year ago.

Coke and manufactured fuel reached the paltry total of 27 tons exported against 313,528 tons in October last year. Imports are quite another story, the large total of 205,841 tons being imported against 90 tons a year ago.

The practical destruction of the coal export business is indicated by the shipment of only 3812 tons against 4,382,484 ton in October last year.

Imports of coal amounted to 3,489,083 tons compared with 1633 tons in Otober last year.

General exports were valued at £53,176,663 compared with £50,680,003 in September and £67,081,986 in October last year.

The value of general imports was £111,013,703 compared with £101,724,341 in September and £108,835,624 in October last year.

Trade Success Rests on Naval Policy

(*Continued from Page* 1486)

permitted other nations to get so far ahead of us in cruiser strength by outbuilding us. It weakens us doubly for, at the next conference, we shall have nothing to trade against the superiority of the other two strong naval powers in cruisers. "Status quo" is one of the strongest levers used in international conferences. If congress should appropriate for a light cruiser program giving the United States as many cruisers as the strongest sea power, it would probably hurry up the next limitation of armament meeting; but it is doubtful whether any other nation will ever suggest giving up an advantage in cruiser strength until an American building program forces them to do so. Paradoxical as it may seem, the surest and quickest way for the United States to promote further reduction of naval armament is to "lay the cards on the table," and appropriate for as many cruisers as the strongest naval power has.

While Uncle Sam's lack of light cruisers places his navy in a weak position in a tactical sense, a part of the treaty negotiated in Washington in 1922 weakens the United States in a strategic sense. Incidentally, tactics concerns the fighting when within fighting distance and strategy, which is much broader, deals with placing the fleet in such position that its pressure will end war in favor of the nation which uses the soundest naval strategy. Sometimes a war is won by total destruction of the enemy fleet, as in Nelson's great victory at Trafalgar, and sometimes by blockade and fleet pressure as in the American Civil war, or in the World war where Germany was finally strangled by the British fleet, though the German fleet was still in existence.

Weak in a Strategic Sense

The weakening of the United States in a strategic sense, by the Washington treaty, came from our virtual promise not to use the fleet west of Honolulu. It was a virtual promise, because a fleet must be supported by nearby bases if it is to be kept in operating condition, and in the treaty the United States agreed to make no improvements in bases now incapable of keeping the fleet in fighting condition.

The United States has two great policies, the Monroe doctrine, which concerns the two American continents, and the open door, which applies to China. In addition, America has its major over-seas interest in the Philippine islands. Now, to protect an interest or to support a policy, the fleet must be able to operate in the area where the policy or interest applies. Even those who know little must realize that it takes many things to keep a complicated machine, like a modern fleet, in operating condition —such as stores, spare parts of machinery, coal, fuel oil, machine shops, dry docks, etc. Those who followed the naval end of the World war know American battleships were sent across the Atlantic so Admiral Jellico would have a preponderence of strength even when a part of the British force was away at naval bases for dry docking and repairs. A few know that the British repair bases were moved as close as possible to Scapa Flow, the base from which the British fleet operated.

At the Battle of Jutland there were many British and German ships so seriously injured that they had to be dry docked before they were again ready to fight. Notwithstanding all this, with a major policy in China and a paramount interest in the Philippines, the Washington treaty commits the United States to no naval base west of Honolulu capable of taking care of the United States fleet after a battle. In this connection it might be mentioned that the British are preparing a fleet base at Singapore. This base is so happily located that the influence of the British fleet can be exerted practically anywhere in the Western Pacific.

There are probably few citizens in the United States willing to see this country engaged in a competition of warship construction, but there are fewer still who would be willing to see this nation take any but the first place in world influence. If national prosperity depends on sea strength, as it always has according to history, then, when our people become convinced of the truth of this principle, the United States will always have a navy at least equal to that of any possible rival for world trade, and will have well equipped naval bases wherever they might be needed.

Naval officers, as a rule, are not fire-eaters. None of them want to see another war if it can be avoided. Most of them have been through one or more wars and they agree with General Sherman's definition. Few of them covet the honors that come to a successful commander if these must be gained at the expense of a future war. Naval officers do, however, like other patriotic citizens, wish to see the navy on a safe basis and the navy is *not* on a safe basis now when two other naval powers have such a superiority in cruisers.

Finally, I believe I am conservative in saying that most naval officers would like to see the country save money by reduction in armament as long as other nations reduce proportionately. But in making the reductions, it must be kept in mind that it takes a long time to build warships and to train the enlisted personnel to man them. It takes longer still to train naval officers in a business as complicated as theirs. More important still, it must not be forgotten how closely national policy and naval strategy are tied together. Any overseas policy is untenable unless it can be supported by the fleet in the area where the policy applies.

Metal Trades Employes Reduced in October

The number of employes in shops represented in the National Metal Trades association declined from 634,780 in September to 608,415 in October. The greater part of this decrease of 26,365 was reported in the Detroit and Michigan district, reflecting the seasonal slowing of machine shop operations. In that district the number was reduced 19,531, from 267,420 to 247,889. The New England district reported a slight gain.

The association's monthly labor barometer shows a composite of weekly earnings in August amounting to $26.76, only two cents below that of July.

Press Builders Merge

Harris Automatic Press Co., Cleveland, Seybold Machine Co., Dayton, O., and the Premier & Potter Printing Press Co. Inc., New York, have been consolidated under the name Harris-Seybold-Potter Co. These companies have been manufacturers of printing presses and other machinery for printers, lithographers and publishers.

Financing of the merger will include an issue of $2,000,000 debentures at 6 per cent, which has been underwritten by the Union Trust Co., Cleveland, Hornblower & Weeks and R. V. Mitchell & Co.

Harris Automatic Press Co. has been in business since 1894, the Seybold Machine Co. since 1892 and the Premier & Potter Printing Press Co., since 1855. In 1919 the latter consolidated with other manufacturers of a similar line of presses.

In 1855 the production of pig iron with anthracite coal exceeded that made with charcoal.

Obituaries

JOHN KING McLANAHAN, formerly president of the Union Shovel Works, Inc., Tyrone, Pa., and prominent industrialist, died in Pittsfield, Mass., recently of heart trouble. He was born in Hollidaysburg, Pa., Dec. 27, 1871. In 1889 he entered the metal-working industries as a machinist in the shops of the McLanahan Stone Machine Co., Hollidaysburg. He became interested in various industrial projects thereafter. He was a director and treasurer of the McLanahan Stone Machine Co., president of the McLanahan-Watkins Co., a director of various other lime and chemical companies. In addition to social clubs he was a member of the American Institute of Mining and Metallurgical Engineers.

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W. J. Logan, assistant controller of the Remington Typewriter Co., New York, died in Calcutta, India, Dec. 1.

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Charles F. Messinger, retired president of the Chicago Nut Mfg. Co., Chicago, dropped dead Nov. 29 while visiting the hay and grain exhibit of the national stock show in that city.

* * *

William B. Carroll, aged 54 years, president of the Carroll Chemical Co., Chicago, died of heart disease at his home there Dec. 3. He had been identified with the chemical and allied industries since 1890.

* * *

J. Edward Cain, aged 55 years, general manager of the Modern Tool, Die & Machine Co., Columbus, O., and vice president of the Frank Held Tractor Co., that city, died Nov. 26 at his home there.

* * *

Walter S. Kupfer, former president of the American Dressler Tunnel Kilns Inc., Cleveland, died recently at Keswick Grove, N. J., while on vacation. Mr. Kupfer was an ordained Presbyterian minister and interested in missionary work.

* * *

Watson B. Phillips, aged 63, vice president of the Phillips Mine & Mill Supply Co., Pittsburgh, died Nov. 25 at his home in Pittsburgh. He was born in that city in 1863 and had resided there all his life. He had been associated with the Phillips company for nearly 40 years, with his three brothers, John M., Robert F. and Frank Phillips. He was a member of the St. Clair and the Pittsburgh Country clubs.

* * *

Albert H. Comstock, vice president of the Marshall-Wells Hardware Co., Duluth, and chairman of the Minnesota commission of the Great Lakes-St. Lawrence Tidewater association, died Nov. 22 in Duluth, aged 79 years. He had been with the Marshall-Wells company since 1895.

* * *

W. J. Turner, district manager at Atlanta of the Ingalls Iron Co., Birmingham, Ala., was instantly killed a few days ago when an automobile he was driving was struck by a Southern railway freight train. Mr. Turner had been connected with the foundry and machinery business in the southeast for some years.

* * *

John M. Browning, inventor of a machine gun of that name and many other arms and machines, died recently in Brussels, Belgium, where he was supervising work in the national armory. Mr. Browning's machine gun was a success from the start. Other notable weapons of Mr. Browning's design are the 45-caliber automatic pistol and the Browning automatic rifle.

* * *

Albert Hamilton Emery, a distinguished inventor, died Dec. 2 at his home in Glenbrook, Conn. He had been in good health until a few days before his death, when he caught a cold. Mr. Emery was 92 years old. He was best known for the invention of testing machines. His first testing machine was built at the Watertown arsenal. Two of his testing machines were installed at the bureau of standards, Washington. He also invented and developed the method of producing guns by hydraulic radial expansion. Mr. Emery was a graduate of the Rensselaer Polytechnic institute, Troy, N. Y. He retired from business seven years ago.

* * *

George E. Luke, 34 years old, head of the insulation section of the Westinghouse Electric & Mfg. Co.'s research department, at East Pittsburgh, Pa., died suddenly Nov. 28. A native of Seneca, Mo., he was a graduate of Missouri university and of Princeton university, having taken post graduate work in the latter school. He joined the Westinghouse company in 1917.

* * *

John Francis O'Neil, former president of the Fulton Iron Works, died at his home in St. Louis Dec. 4, at the age of 70. Born in Rockport, N. Y., Mr. O'Neil went to Dubuque, Iowa, when a young man, going to St. Louis in 1888 as general superintendent of the Fulton Iron Works. He rose to vice president, and in the reorganization of the company in 1905 became its president. He resigned in 1917 and served a year as chairman of the board. In 1918 he organized the O'Neil Iron Works at Buffalo, which went into receivership three years later.

* * *

John Rainey McGinley, Pittsburgh, aged 75, a pioneer in the natural gas industry in western Pennsylvania and an organizer of the Philadelphia Co., of which he was vice president and general manager for many years, died in New York Nov. 29 after an illness of several months. He had lived in New York for the past six years. He was a prominent figure for many years, was an associate of George Westinghouse, with whom he formed the Westinghouse Electric & Mfg. Co. and the Westinghouse Air Brake Co. He was president and director of the Duff Mfg. Co., vice president of the R. D. Nuttall Co., chairman of the board of directors of the Gary Screw & Bolt Co., and director of the following companies: Chicago Pneumatic Tool Co., First National Bank of Wilmerding, Fidelity Title & Trust Co. of Pittsburgh, East End Savings & Trust Co., Dwight P. Robinson, Inc., and the Union Fidelity Title Insurance Co.

G. W. Gilderman, superintendent of the Dodge Mfg. Corp., Mishawaka, Ind., recently addressed a meeting of the American Society for Steel Treating at Fort Wayne, Ind., on the subject. "The Hidden Element." He dealt particularly with the importance of the human factor in steel treating.

Machinery

Slowing Down of Sales During Past Week Is More Pronounced—Rumors of Price Increases Persist—Auction Sales Numerous

FURTHER indications of curtailment in buying of machine tools and shop equipment have been noted during the past week. Inquiries still are fairly numerous, but in many cases the prospective buyers are merely seeking quotations for use in preparation of budgets for 1927. The holiday and inventory periods also are exerting some influence on the market. Rumors of price increases on boring mills, planers, lathes and specialty machines continue to come from the Chicago district. It is hinted that the advances will be as much as 10 per cent. Pullman Car & Mfg. Co. again has deferred action on its lists for Chicago and Atlanta. The New York, Pittsburgh and Chicago districts report increased activity in railroad buying. Used tools are affected by auction sales.

New York, Dec. 7.—Machine tool demand continues spotty, nevertheless, a few fair-sized orders are reported. New York Edison Co. has closed on fully ten items, all going to a local dealer. Included were lathes, shapers, radial drills, bolt cutter, etc. Waltham Watch Co., Waltham, Mass., has closed on 15 bench lathes, and Delco Light Co., Dayton, O., on seven profiling machines, both orders going to the Pratt & Whitney Co. A new list of considerable size is reported in the market.

General Electric Co., Schenectady, N. Y., continues to bring out inquiries and considerable equipment is yet to be purchased by Western Electric Co. for its plant at Kearny, N. J. Among railroad orders are a hydraulic press for the Union railroad, a 600-ton wheel press for Gulf Coast Lines, a 300-ton wheel press for Green Bay & Western and a 32-inch shaper for Delaware, Lackawanna & Western, all going to Manning, Maxwell & Moore Inc. This builder also booked a 90-inch driving wheel lathe and a 90-inch quartring machine for the Erie and a double axle lathe and a 48-inch car wheel borer for Pacific Fruit Express.

Among orders recently booked by the Niles-Bement-Pond Co., are a 6-foot radial drill for a tool company, Beacon, N. Y.; a vertical drill press for the Central of Vermont railroad; a floor grinder for Chicago & North Western; 6-foot vertical boring machine and a 44-inch side head borer for the C. & G. Cooper Co., Mt. Vernon, O.; and a 6-inch spindle, horizontal floor borer for a Michigan concern.

Boston, Dec. 7.—Sales are holding up well in the face of considerable buying curtailment. General Electric Co. bought a large radial drill and some other equipment for its New England plants. A Springfield, Mass., manufacturer bought a radial drill. Chapman Valve Mfg. Co., Springfield, Mass., is in the market for four or five tools and recently has made several purchases. Boston & Maine railroad is buying equipment for the extension to its Billerica, Mass., shops. A Worcester, Mass., manufacturer has placed several attractive tool orders during the week, including a radial drill and special grinder. A printing machinery manufacturer bought a planer. One Boston dealer reports sales of the last two weeks ahead of any similar period since spring. Prices of new tools are exceptionally firm, but some types of used tools have been placed on the market at low levels recently. Approximately 25 used tools have been placed on the market by the Luxor Cab Mfg. Co., Framingham, Mass. Unfilled orders of New England tool manufacturers continue to decline.

Pittsburgh, Dec. 7.—Inquiries for machine tools are not numerous, many being withheld until after the holiday and inventory periods. Several sales of machines for distant points are noted, including two drill presses for Chicago and a cylinder boring machine for New Orleans. A number of other single items for users in this locality are noted, including three small machines and a motor-driven cutter and tool grinder for Westinghouse Electric & Mfg. Co., which is understood to be finishing up its quarterly purchases. Norfolk & Western railroad probably will buy some machines in the Cincinnati district, and the Pennsylvania is about to close on a lathe, radial drill, shaper, and milling machine, as noted last week.

CRANE ORDERS PLACED

Among single orders were: 5-ton crane for Witherow Steel Co., Pittsburgh, as indicated last week, to Bedford Foundry Machine Co.; 10-ton handpower crane for Peoria & Eastern railroad, Cincinnati, to Whiting Corp.; 25-ton gantry crane for Pennsylvania railroad, to Whiting Corp.; 3-ton electric crane for R. H. Comey-Brooklyn Co., Brooklyn N. Y., to Shepard Electric Crane & Hoist Co.; locomotive crane for Viscose Co., Philadelphia, to Brown Hoisting Machinery Co.; 4-ton grab bucket crane for ash pit work at Bethlehem, Pa., for Central Railroad of New Jersey to Niles Crane Corp.; 5-ton trolley for New York Central to Niles Crane Corp.; 20-ton crane for Stevens & Wood, New York, to Whiting Corp.; 1-ton single I-beam crane for Welte-Mignon Corp., New York, to Chisholm-Moore Mfg. Co.

CRANE ORDERS PENDING

Seventeen cranes for Gary, Ind., tin mill of American Sheet & Tin Plate Co.; revised bids on roller bearing cranes being asked.

Six electric overhead cranes for American Steel & Wire Co., Worcester, Mass., two on one list for a power plant and four on another; award expected shortly.

Two or three cranes for Wheeling Steel Corp., Martins Ferry, O.; bids about to be asked.

Two 10-ton cranes for Safety Cable Co., Bayonne, N. J.; award expected shortly through Walter Kidder, New York.

Two handpower cranes of 5 and 10-ton capacity and six large chain block hoists for Phoenix Utility Co., New York; bids asked.

5-ton electric crane for City Iron Works, Brooklyn; bids asked.

A manufacturer of seamless tubes wants three tapping machines. Shenango Furnace Co. and Valley Mould & Iron Corp., are expected to buy machine shop equipment for Sharpsville, Pa. and Hubbard, O., respectively. Crane inquiries are scarce and only a few single awards are noted. The American Sheet & Tin Plate Co. is asking revised bids on 17 or more for Gary, Ind., with roller bearings.

Chicago, Dec. 7.—December is failing to bring out important fresh inquiries for machine tools, although prospective purchasers are feeling out the market for quotations before drafting next year's budgets. Several railroads are inquiring for scattered lots, including the Burlington for a half dozen items. Pullman Car & Mfg. Co., whose inquiry has been out for several months, has deferred further the closing of the lists for its Atlanta plant and Pullman, Ill., works. From 35 to 40 machine tools will be offered at auction next Thursday at the Crow Elkhart plant, at Elkhart, Ind. Dealers in used tools report a quiet market, both as to inquiries and sales. Reports as to future prices place the probable advance on boring mills, planers, lathes and specialty machines as much as 10 per cent. This advance is likely to reflect increased labor costs, it is said.

Cleveland, Dec. 7.—Machine tool and equipment business in this territory is extremely spotty and gradually declining as the holiday and inventory period approaches. Inquiries are small and for single machines in most cases. However, dealers are optimistic as to business after the opening of the new year and expect to see sales turn upward. Manufacturers are busy and are about to close a year of good operations. Used equipment is not so lively but averages better than new, as purchasers require tools for immediate use. Except in isolated cases, little activity is to be found in the Detroit automobile industry.

The Pittsburgh chapter of the American Society for steel Treating was addressed on Dec. 2 by O. L. Pringle, superintendent of the metallurgical and inspection departments, Pittsburgh Crucible Steel Co., Midland, Pa. Mr. Pringle's subject was "A Review of Some Phases of Modern Steel Manufaceure."

Here and There in Industry

Live Information Which Records the Expansion of Various Lines of Productive Enterprise

KEMPSMITH MFG. CO., Milwaukee, is being refinanced with a mortgage bond issue of $200,000 and a reorganization has been completed by the election of Robert J. Wilson, Duluth, Minn., president, and a new board of directors. The latter consists of John W. Kieckhefer, Adolph Wilmanns, John R. Stewart, A. R. Munkwitz, Robert J. Wilson, Frank Wollaeger Jr., John Goetz and Edward E. Leason.

* * *

THE NATIONAL ROLL & FOUNDRY CO., Avonmore, Pa., recently received an order for Baird water-cooled floor for the sheet mill at Sparrow's Point, Md., for the Bethlehem Steel Corp.

* * *

STRAND & SWEET MFG. CO., manufacturers of insulated and enameled wire, has completed two large additions to its plant at Winsted, Conn., and is now one of the largest manufacturers of insulated wire in the East. It has recently received large orders from Europe.

* * *

ROYAL TYPEWRITER CO. is moving into an addition to its plant at Hartford, Conn., which has been completed. The new building covers a ground area of 100 x 210 feet. One part will be an employes' restaurant with a seating capacity of 2000.

* * *

BEACON OIL CO. of Boston, subsidiary of the Massachusetts Gas Companies has purchased 60 acres in Hartford and Wethersfield, Conn., on which will be erected extensive docks for the unloading of oil from tankers which will travel up the Connecticut river. A pipe line a mile long will connect the docks to storage tanks.

* * *

RICHMOND HILL FOUNDRY, INC., Richmond Hill, N. Y., owned by the Wm. H. Nicholls Co., Inc., manufacturer of foundry equipment, was recently badly damaged by fire. However, a large stock of castings for machines of all sizes and types manufactured by this company, was carried on hand and with this stock, together with machines in process of manufacture, the company will be able to make regular deliveries until its foundry is rebuilt. Plans are now under way for the erection of a new steel and concrete building.

* * *

LINK-BELT CO., Chicago, was successful in obtaining the contract to install a coal and ash handling system in the large addition being made to the boiler room of the North Point pumping station of the Milwaukee municipal water works system. The total cost of the general enlargement of the station is estimated at $500,000 or more.

* * *

WARREN CITY TANK & BOILER CO., Warren, O., has been awarded a contract for two, 500,000-gallon gasoline tanks for the F. C. Bellis Co., who will erect a large gasoline, fuel oil and kerosene storage plant at West Auburn, Mass. Plans are being prepared for a 1,260,000-gallon fuel oil tank, and tanks which will be built at the West Auburn site in the near future will have a capacity of 3,500,000 gallons.

* * *

CONTRACTS have been awarded by the Elkhart Sand & Gravel Co., Elkhart Lake, Wis., for one of the largest sand and gravel plants in the Middle West, having a capacity of 25 cars a day. The entire machinery, belt conveyor system, screens, etc., will be furnished and installed by the Bakstad Machinery Co., Elkhart, Ind. A feature will be the washing plant to treat all sand, gravel and crushed stone before shipment. Peter Kramer is superintendent of the gravel concern.

* * *

LaCROSSE PLOW CO., LaCrosse, Wis., reopened its plant Dec. 1 and has scheduled an extensive program under a reorganization plan which places B. C. Smith temporarily at the head of the concern as trustee. He is president of the Smith Mfg. Co., LaCrosse. It is understood that difficulties dating to the time of the post-war slump have been overcome and working capital has been provided to enable the concern to grasp opportunities growing out of steady improvement in business.

* * *

HARDI-TYNES MFG. CO., Birmingham, Ala., has started the manufacture of air compression machinery on a large scale, according to an announcement by officials of the company. For some years this company has been manufacturing steam engines, and air compression machinery represents a new product. The compression machinery made can be operated either by steam or electricity, and is equipped with a newly invented valve system which was patented by this concern.

* * *

DELOACH MFG. CO., Atlanta, Ga., one of the pioneer machinery manufacturing firms in the Southeast, has been acquired by the Sanders Mfg. Co., also of Atlanta, according to an announcement by an official of the latter concern. In conjunction with the Wrinkle Brothers Foundry & Machine Co., of Dalton, Ga., a few miles from Atlanta, the DeLoach business will be continued by the Sanders company. Its products are machinery and parts for grist mills, saw and shingle mills, and complete mills. The DeLoach company had been in business in Atlanta for many years under the direction of A. A. DeLoach, who invented many of the machinery lines manufactured.

* * *

ORGANIZATION of the Hassler Mfg. Co., Inc., Indianapolis, successor to Robert H. Hassler, Inc., automobile accessory manufacturer, has been announced by Guy Lemmon, president of the new company and vice president of the old. The new vice president and treasurer of the company will be Arthur B. Shaft, who goes to Indianapolis from Faribault, Minn., where he was an executive in a shoe manufacturing company. He formerly was connected with the National City Bank of New York. Edwin Gibbs, New York, will be secretary, Miss Velma Henry assistant treasurer and Fred Asberger, assistant secretary. Charles Christie will be factory superintendent and J. E. Casey sales manager.

* * *

ACCORDING to recent announcement by the Sheffield-Tuscumbia Chamber of Commerce, Sheffield, Ala., three large northern companies have recently announced their intention of establishing branch plants in the Muscle Shoals district during the early part of the coming year. These include the Super Tools Mfg. Co.,

Equity building, Detroit, the Muscle Shoals plant to manufacture wrenches at the outset, but other tools to be added after the factory is in production; the Bliss Mfg. Co., Book Tower building, Detroit, is to establish a plant for the manufacture of refrigerating machinery; and the Sorg Engine Co., Owosso, Mich., will establish a branch plant for the manufacture of internal combustion engines for use with farm lighting plants.

* * *

BOX CRANE & HOIST CO., Philadelphia, has established an electric hoist division with R. H. McGredy as sales manager. E. K. McGredy was previously sales manager of the Shepard Electric Crane & Hoist Co., Montour Falls, N. Y., a company he had been associated with about 20 years. The Box company is also establishing a Chicago office in charge of R. G. Wadd, who until six months ago was chief engineer of the Shepard Electric Crane & Hoist Co. Mr. Wadd is a graduate of the University of Michigan. G. A. Mitchell continues as secretary and director of sales.

Auto Industry Leads in Bonus System

Of more than 500,000 employes in 40 industries only 8 per cent are affected by regular individual or group premium or bonus methods, according to results of a survey conducted by the Sherman Corp., Boston. The proportion of the workers on straight time basis is 61 per cent, and on piece rate, 31 per cent.

Following is the percentage division in some of the industries that were surveyed:

	Straight time	Piece rate	Premium or bonus
General average	61	31	8
Agricultural Implements	56	42	2
Automotive products	17	18	65
Building materials — brick, clay products, stone, etc.	60	37	3
Chemical and pharmaceutical	65	18	17
Construction—buildings and public works	100	....	....
Electrical products and radio	60	39	1
Foundries—cast iron, malleable, steel and alloy	55	41	4
Hardware, toys and specialties	46	45	9
Machinery	68	18	14
Metals and metal products	49	27	24
Power plant equipment	75	18	7
Railway equipment—cars, locomotives, etc.	31	68	1
Shipbuilding	90	10	....
Stoves, furnaces and radiators	49	46	5

Steel is included under metals and metal products. In the steel industry 10.4 per cent of the mill employes were reported on a tonnage basis.

"It is significant", says the corporation's analysis, "that the automotive industry leads in percentage of workers on premium or bonus, 65 per cent under some premium or bonus method.

"Productivity of labor in this industry per man hour has increased over 200 per cent in ten years. Six billion dollars annually in wages are disbursed. The industry's financial structure has grown tremendously. It seems logical to conclude that a certain connection exists between the advanced policies and practices in reference to wage payment and the outstanding position of the industry."

Foundry Equipment Sales Drop in October

Cleveland, Dec. 7.—Foundry equipment sales in October, valued at $396,354, fell off but 1 per cent from September, according to reports of 13 manufacturers to the Foundry Equipment Manufacturers' association. Shipments of $447,189 in October registered a gain of 18 per cent over September, but a loss of 0.5 per cent from October 1925. Unfilled orders on Nov. 1 were valued at $524,612, a slight increase over $527,273 on Oct. 1. Further comparisons of sales, shipments and unfilled orders follow:

	Sales	Shipments	Unfilled orders
1925			
October	424,054	400,646	544,041
Total to Oct. 31	$3,651,188	$3,623,301	....
November	480,327	414,148	518,794
December	416,610	472,144	593,455
Total	$4,665,300	$4,362,794	....
1926			
January	$ 414,121	$ 445,377	$ 550,016
February	472,814	422,004	501,793
March	483,010	525,655	536,978
April	454,626	402,494	504,671
May	425,638	415,082	506,214
June	407,940	417,632	524,382
July	378,163	448,390	511,290
August	391,935	384,924	411,119
September	400,464	377,798	422,148
October	396,354	447,189	522,273
Tot'ls to Oct. 31	$4,205,065	$4,286,545	....
Nov. 1	....	....	524,612

More iron ore forges were operated in New York than rolling mills as late as 1876.

Industrial Business Changes

KEYSTONE STEEL & WIRE CO., Peoria, Ill., has appointed Theodore Geissman & Co., 624 South Michigan boulevard, Chicago, its district sales agent for the sale of wire nails, smooth wire and plain wire as well as other wire products.

* * *

American Nickel Corp., Clearfield, Pa., has changed its name to American Mond Nickel Co.

* * *

Kingsbury Mfg. Co., Keene, N. H., has changed its name to the Kingsbury Machine Co.

* * *

Montgomery Ward & Co., Chicago, has sold its entire interest in the American Steel Products Co., Macomb, Ill., to local interests.

* * *

Wayne Tank & Pump Co., Fort Wayne, Ind., has changed its name to the Wayne Co.

* * *

Wallace Machinery & Tool Co., Indianapolis, Ind., has established its plant at 470 Massachusetts avenue.

* * *

American Brass & Iron Co., Detroit, has moved from 6425 Crystal street to the Twelfth street Terminal building. It occupied its former location 21 years.

* * *

Struthers-Wells Co., Warren, Pa., has opened an office at 807 Liberty Trust building, Broad and Arch streets, Philadelphia, in charge of W. L. Delaney.

* * *

Wickes Boiler Co., Saginaw, Mich., effective Jan. 1, will move its Detroit district sales office to the General Motors building, Detroit.

* * *

Universal Crane Co., Cleveland, has established a direct branch to handle its business in the Southeast at 1207 Fourth National Bank building, Atlanta, Ga., in charge of E. W. Matthews.

Construction and Enterprise

Concise and Timely Business Building Opportunities from the Field of Industry

BIRMINGHAM, ALA.—Stockham Pipe & Fittings Co., 4100 North Tenth avenue, manufacturer of cast iron pipe, valves and fittings, is building a large addition to its plant to increase production.

GADSDEN, ALA.—Walworth Alabama Co. is building a cleaning room 42 x 100 feet at Attala, Ala.

LOS ANGELES—Standard Boiler & Speed Works, 226 Queirolo street, is having plans made for a plant in the Vernon industrial district.

SAN FRANCISCO—Bowie Switch Co., Wells Fargo building, will build a 2-story machine shop.

ROCKY HILL, CONN.—Connecticut Foundry Co. has let contract to C. P. Waterman Inc., 43 Farmington avenue, Hartford, Conn., for a 1-story addition.

SHELTON, CONN.—Mullite Refractories Co. Inc. has been incorporated with 2500 shares no par value to manufacture refractories, fire brick, furnace and kiln linings and crucibles by H. George Carroll, Vincent W. Quinn and Charles F. Bailey, all of New York.

NEW CASTLE, DEL.—Penn Seaboard Steel Co. will rebuild its electrical and machine shops recently burned.

ST. PETERSBURG, FLA.—Atlantic Coast Line, J. E. Willoughby, chief engineer, Wilmington, N. C., has started construction of machine shops here, for which much equipment will be required.

BELLEVILLE, ILL.—Elite Porcelain Enameling Co., Lebanon avenue and Southern railroad, has been incorporated with $30,0000 capital to manufacture enameled products by Joseph G. Arnold, Charles J. Corty and C. W. Schmiz. Preston K. Johnson, First National Bank building, Belleville, is correspondent.

CHICAGO—Atlas Forging Co., 1501 South Fifty-fifth court, will rebuild the burned portion of its plant.

CHICAGO—Bronze Metal Works Inc., 3361 West Superior street, has been incorporated with $35,000 capital to manufacture lamps, fixtures, vases and similar articles by Morris Favish, Reuben Favish and Otto Oestreich. Ruckberg & Burr, 111 West Monroe street, suite 716, are correspondents.

CHICAGO—Rainbo Products Co., 243 East Huron street, has been incorporated with $20,000 capital to manufacture automotive equipment and accessories by William Recht, Sadye Sternberg, and Rose Sternberg. Maxwell L. Andalman, 155 North Clark street, is correspondent.

CHICAGO—National Traffic Appliance Corp., 77 West Washington street, has been incorporated with $50,000 capital to manufacture traffic appliances and signals by Clyde B. Whitmore, Samuel E. Weisenheimer and Aaron Gerchikov. R. L. McVean, 10 South LaSalle street, is correspondent.

CHICAGO—Western Electric Co., Hawthorne Works, C. L. Rice works manager, is starting a series of additions to cover 18 to 24 months, affecting 16 buildings, remodeling and reconstruction, to increase output of toll-cable by 70 per cent. General contract to Turner Construction Co., in charge of John P. H. Perry, resident vice president.

Where additional information is presented, reference is made to date of issue in which previous item appeared.

CHICAGO—Port Huron Corp. of Illinois has been incorporated with $1,100,000 capital to manufacture farm equipment, implements and machinery by Owen J. Stocking, Edward P. Brennan and Herbert N. Ewing. Gerald L. McMullen, 140 North Dearborn street, is correspondent.

CHICAGO—King Pneumatic Tool Co., J. M. Butler president, 1735 Armitage avenue, has let general contract to Chicago Industrial Construction Co., 53 West Jackson boulevard for a 1-story plant 90 x 108 feet at 2711 North Ashland avenue. Bids on separate contracts are being taken by general contractor.

CHICAGO—Doughnut Equipment Co., 130 North Wells street, suite 703, has been incorporated with $20,000 capital to manufacture machinery and bakers accessories by Arthur A. Sherrard, M. E. Pierson and Peter Kirbach. Lyons & Sherrard, 130 North Wells street, are correspondents.

DECATUR, ILL.—Farnes Mfg. Co., manufacturer of electrical equipment and fixtures has let contract to Walter Ware, 908 West Padkard street, for a 1-story addition 40 x 100 feet.

ROCKFORD, ILL.—Barber-Colman Co., Loomis and River streets, is building a 5-story addition for manufacture of dies, reamers and taps.

ANDERSON, IND.—Ames Shovel & Tool Works is building a brick and steel addition 60 x 210 feet. The entire pant is to be replaced one unit at a time without interrupting production.

BLOOMINGTON, IND.—H. & P. Electric Co. is having plans drawn for a 2-story plant 50x150 feet.

FORT WAYNE, IND.—Edmunds Electric Co. electircal equipment, has let contract to Indiana Engineering & Construction Co., Central building, for a 2-story plant 40x120 feet.

INDIANAPOLIS—Weymann American Body Co. will equip the plant of the National Motor Car Co. which it has taken over, for the manufacture of automobile bodies.

INDIANAPOLIS—Standard Railway Equipment Co. has been incorporated with $100,000 capital and 10,000 shares no par value to deal in railroad equipment by G. C. Stokes, Harry O. Garman and C. Milton Kelly.

AMES, IOWA—Tilden Mfg. Co., J. G. Tilden president, is having plans made for a 3-story addition 75 x 140 feet at Fifth and Douglas streets.

KEOKUK, IOWA—Keokuk Steel Casting Co. is bulding additions and adding to equipment to increase its output nearly half.

PADUCAH, KY.—Illinois Central railroad, main offices East Eleventh street, Chicago, will build a 2-story power plant 150 x 240 feet, in connection with its large shop development here. Contract to Joseph E. Nelson & Sons, 35 South Dearborn street, Chicago.

BALTIMORE—Consolidated Gas, Electric Light & Power Co., Lexington building, is having plans made for a 2-story addition to its power house at 1050 North Front street.

FREDERICK, MD.—Frederick Machinery Co. has been organized by James A. Rogers, Buckeystown, Md.

BILLERICA, MASS.—Boston & Maine railroad, North Station, Boston, will build a 1-story boiler and plate shop 150 x 572 feet, to house several departments at the present shops.

BOSTON—Standard Replacement Parts of New England Inc. has been incorporated to manufacture automotive parts and accessories, with $10,000 capital, by Irving Schneider president, 84 Devon street, Roxbury, Mass., William Carp and Ida Carp.

FITCHBURG, MASS.—Loud Slide Valve Engine Co. Inc. has been incorporated with $50,000 capital to manufacture internal combustion engines, machinery and tools by George A. Loud, president, 28 Day street, Fitchburg, Mass., John H. Boyle, treasurer, 82 South street, Sidney Castator, Robert S. Parks, William C. Goodwin and George L. Dawley.

MARBLEHEAD, MASS.—Mason Electric Co. Inc. has been incorporated with 500 shares on par value to do electrical construction and installation of electrical and other machinery by Charles B. Mason, president and treasurer, 268 Humphrey street, Arthur B. Nelson vice president, and Laura G. Mason, clerk.

NORTH ATTLEBORO, MASS.—Viand Mfg. Co. has been incorporated with $50,000 capital to manufacture jewelry and novelties by Louis F. Viand, president and treasurer, 21 Whiting street and E. E. Viand, clerk.

SOMERSETT, MASS.—Board of trustees of Somerset is planning addition of pumping equipment at municipal waterworks plant. F. A. Barbour, Tremont building, Boston, is engineer.

WORCESTER, MASS.—Burlingame Machine Co. has been incorporated with $50,000 capital to manufacture wire-drawing machinery and special machines and equipment by Carl E. Tideman president, 6 Payson street, Worcester, Mass., and Earl C. Hopkins, 56 Moore street, treasurer.

ADA, MICH.—Michigan Water Power Co. is building a second hydroelectric generating plant and will build transmission lines.

DETROIT—Acme Stamp Co. has been incorporated with $50,000 capital to manufacture stamps and dies by Winfield F. Forrester, 5214 Maplewood avenue, Detroit, Emery S. Hendrickson and Verne E. Sorge.

DETROIT—Panyard Machine & Mfg. Co., G. W. Panyard president, manufacturer of piston rings and automotive parts, has bought 10 acres at Muskegon, Mich., and will build a pant there.

DETROIT—New York Bed Spring Mfg. Co., S. and R. Wiesman, 638 Brady avenue, owners, are having plans made for a 2-story plant

66 x 100 feet, by I. M. Lewis, 503 Congress building.

DETROIT—Dodge Bros. Inc. will build a 1-story machine shop addition 200 x 1600 feet from plans by Smith, Hinchman & Grylls, Marquette building.

FLINT, MICH.—Marvel Carburetor Co. will build an addition, one story.

KANSAS CITY, MO.—B. P. Lientz Oil Furnace Co., 3409 East Eighteenth street, will build a 1 and 2-story plant, 50x115 feet.

ST. LOUIS—Jones Wheel Puller Co. has been incorporated with $25,000 capital to manufacture automotive devices by William K. Kloppenberg, 1921 Penrose street.

BAYONNE, N. J.—Safety Cable Co., Bergen Point, will build a 1-story addition to its plant.

ELIZABETH, N. J.—Kiddies' Metal Toys Corp. has been incorporated with 100 shares no par value to manufacture metal toys by Inez D. Desoucey, Jersey City; Minnie R. Deshong, Brooklyn, N. Y.; Walter M. Schwartz, New York. Leventritt, Riegelman, Carns & Schwartz, New York, are attorneys.

HARRISON, N. J.—Harrison Nut & Bolt Co., Second street, has let general contract to William McEvoy, 420 Warren street, for a 2-story factory and warehouse, 100 x 100 feet. J. W. Baker, 111 North Fourth street, is architect.

HOBOKEN, N. J.—Tungsten Contacting Corp. has been incorporated with $125,000 capital to manufacture rare metal products by Rudolph Wilderman, Alfred C. Schmidt and Marie Schmidt, West New York, N. J. Walter J. McIntyre, Jersey City, N. J., is attorney.

IRVINGTON, N. J.—Austin Mfg. Co., 400 North Michigan avenue, Chicago, road machinery, has leased a 1-story plant here to be used in assembling its product.

JERSEY CITY, N. J.—National Burners Inc. has been incorporated with 50,000 shares no par value to manufacture heaters and furnaces by J. E. Braud, L. Tarantino and Alfred F. McCabe.

KENILWORTH, N. J.—United Engineering Corp., Newark, N. J., manufacturer of mechanical equipment, has bought a site of 2½ acres here and will equip it for manufacturing its products.

MOUNT HOLLY, N. J.—Mount Holly Water Co. will add to its pumping equipment, financing for this purpose now being under way.

NEWARK, N. J.—Roland Corp. has been incorporated with $125,000 capital to manufacture gas, oil and electric stoves by Bert Roth, Jerome Horland and Catherine Donnelly. William L. Greenbaum, Newark, is attorney.

NEWARK, N. J.—John Turton and William H. Beidelman, of Maplewood near here, and W. Eugene Turton, of this city, have organized a new company to manufacture mowers and tools.

NEWARK, N. J.—Auto Strop Razor Co. has purchased property adjacent to its plant here for future expansion. With this asquistion, the company has about five acres, having frontages on Frelinghuysen avenue and Virginia street.

NEWARK, N. J.—G. A. Kleissler Co. has been incorporated with $100,000 capital to manufacture steel metal products by Gottlieb A. Kleissler, Katie Kleissler and Edwin A. Kleissler. Grosken & Moriarty, Newark, are attorneys.

TRENTON, N. J.—Trenton Brass & Machine Co., Dale and Prospect streets, has let contract to R. T. Bowman Co., Broad Street Bank building, for a 1-story addition to its plant.

BROOKLYN, N. Y.—Sutter Marine Squipment Co., East Ninety-second street, is inquiring for additional machine tool equipment.

BROOKLYN, N. Y.—Bush Terminal Inc., Forty-third street, has let contract to Turner Construction Co., New York, for large power plant and equipment.

BROOKLYN, N. Y.—Mutual Electric & Hardware Mfg. Co., 28 Verandah place, will add to its machine tool equipment to increase output.

BROOKLYN, N. Y.—Penn Brass & Bronze Works, 107 Dobbin street, is having plans drawn by Gustave Erda, 826 Manhattan avenue, New York, for a 2-story foundry 40 x 100 feet.

BROOKLYN, N. Y.—Robert Gair Co., manufacturer of paper products, will move its Brooklyn plant to Piermont, in Rockland county, next March, according to recent advises. The local plant will be either leased or sold.

BROOKLYN, N. Y.—Crone's Jiffy Hotkup Co. has been incorporated to manufacture machinery with 500 shares no par value by J. Schwartz, R. L. Schaefer and H. S. Laudau. Furst, Schwartz & Schwager, 215 Montague street, is attorney.

LONG ISLAND CITY, N. Y.—Bayonne Steel Ceiling Co., 223 West Nineteenth street, New York City, will build a manufacturing building at the corner of Hunter's Point avenue and Orton street.

LONG ISLAND CITY, N. Y.—Hammar Structural Steel Co. Inc., Plaza building, has been incorporated with $50,000 capital to fabricate and erect structural steel and will build and equip a plant.

MIDDLETOWN, N. Y.—Middletown File Co. has been incorporated with $275,000 capital to manufacture files by J. Galloway, R. Hommel and J. Ball. S. W. Eager, Middletown, is attorney.

NEW YORK CITY—Sanderson & Porter, engineers, of this city, are inquiring for structural steel for a power station.

NEW YORK—Board of transportation of New York City, 49 Lafayette street, will build a further addition to its subway car repair shops at Lenox avenue and 148th street.

NEW YORK—Neslo Picture Corp. has been incorporated with $100,000 capital to manufacture motion picture machines by T. R. Laing and R. E. Olson. M. B. Cushner, 17 Madison avenue, is attorney.

NEW YORK—F. & H. Automatic Stop has been incorporated with 100 shares no par value to manufacture machinery by R. O. Holt, M. L. Holt and H. C. Fahrenkrug. L. Stone, 290 Broadway is attorney.

NEW YORK—Buckwheat Burner Corp. has been incorporated to manufacture coal-burning apparatus with $20,000 capital by M. Rhulen, A. C. A. Held, and S. E. Margolin. J. B. Margolin, 2672 Fulton street, is attorney.

NEW YORK—Saf-Speed Corp. has been incorporated with $100,000 capital to manufacture auto speed devices by T. F. McGrath, G. S. A. McNail and H. A. Urquhart. G. F. Hickey, 59 Wall street, is attorney.

NEW YORK—Service Die Cutting Co. has been incorporated with $10,000 capital to manufacture dies by M. Freedman, S. Milling and S. Kislewitz. L. N. Halperin, 291 Broadway, is attorney.

NEW YORK CITY—Contract for structural steel for subway car repair shop additions at Lenox avenue and 148th street, has been awarded by the local transit commission to the American Bridge Co.

NEW YORK—E. P. Gleason Mfg. Co. Inc., a newly-organized concern, is expanding the business of a company of the same name which it has taken over, at 37 Murray street, manufacturing electric lighting fixtures and equipment. A commercial lighting unit will be manufactured.

NEW YORK—Chromium Machine Co. has been incorporated with $50,000 capital and 500 shares common stock no par value to do metal coating work and make machinery to do that work, by R. K. Bissel and E. J. Fisher. W. Ferguson, 52 William street, is attorney.

RICHMOND HILL, N. Y.—Richmond Hill Iron Foundry, Ninetieth avenue and 126th street will rebuild its burned foundry.

ROCHESTER, N. Y.—William H. Wilson Iron Works has been incorporated with $50,000 capital to manufacture iron products by W. H. Wilson and E. Allen. J. F. Thomas, Rochester, is attorney.

ROCHESTER, N. Y.—Fit-All Floor Polishing Attachment Co. Inc. has been incorporated to manufacture machines and attachments for polishing floors with $100,000 capital by Richard F. Staley, 537 Brooks avenue, Frank I Simpson, 1059 Portland avenue, and William C. Staley, 1904 Culver road.

OMAHA, NEBR.—Union Pacific Railroad company, Union Pacific building, will build an engine house and machine shop at Ogden, Utah.

GREENSBORO, N. C.—Whitman-Douglas Co., East Washington street, manufacturer of plumbing equipment, has leased a building for storage and service and will equip a shop in connection.

GREENSBORO, N. C.—Carolina Plating & Galvanizing Co. has been incorporated with $50,000 capital to operate a plant for metallic coating of metals by W. C. Howes, Alice V. Howes and O. J. Williams.

MOUNT AIRY, N. C.—Board of commissioners will add centrifugal pump and motor, steel tank and tower to municipal waterworks.

WINSTON-SALEM, N. C.—Carolina Iron Co. has been incorporated with $50,000 capital to deal in iron and steel and other metals by C. M. Thomas, F. L. Saunders and B. D. Perry.

BALTIMORE, O.—Gas Appliance Mfg. Co. has been incorporated with 100 shares no par value by H. J. Weddell, E. M. Smith, H. H. Hall, Charles Merra and J. L. Rockey.

CINCINNATI—Prest-O-Lite Co. has let contract to the Ferro Concrete Construction Co. for additional buildings at its plant at Brotherton road and the Pennsylvania railroad.

CLEVELAND—Machine Specialties Corp. has been incorporated with $1000 capital by N. A. Cannon, A. B. Lefton, C. K. Snyder, M. A. Ciarletta and B. Seigel.

DAYTON, O.—Herbert Weiler, 37 North St. Clair street, will build a 1-story welding shop at 318 East Second street.

DAYTON, O.—International Tool Co., J. J.

Iron and Manganese Ores and Minerals

Iron Ore

LAKE SUPERIOR ORES

Per Gross Ton Lower Lake Ports

Old range bessemer, 51½ per cent iron	$4.55
Mesabi bessemer, 51½ per cent iron	4.40
Old range nonbessemer, 51½ per cent iron	4.40
Mesabi nonbessemer, 51½ per cent iron	4.25

EASTERN LOCAL ORES

Cents per unit delivered at Eastern Pennsylvania and New Jersey furnaces

Foundry and basic 53 to 63 per cent	9.00 to 10.50
Copper free low phosphorus 53 to 65 per cent	nominal

FOREIGN IRON ORE

Cents per unit, f.o.b. cars Atlantic ports

Spanish low phosphorus, 52 to 54 per cent	10.00 to 11.00
North African low phosphorus	9.25 to 9.75
Swedish and Norwegian low phosphorus, 68 per cent	10.25 to 10.75
Swedish foundry or basic, 66 to 68 per cent	9.00 to 9.50
Spanish foundry or basic, 50 to 54 per cent	8.75 to 9.25
North African foundry and basic 50 to 54 per cent	8.50 to 9.50

(All foreign ore prices now nominal)

Manganese Ore

Prices do not include duty at rate of 1 cent per pound of metallic manganese contained.

Brazilian, minimum, 47 per cent	nominal
Indian, minimum 47 per cent	36 to 38 cents
Caucasian, 53 to 55 per cent	
Washed	40 cents

Fluor Spar

85 and 5 per cent grade

Washed gravel, Kentucky and Illinois mines, per net ton	$18.00
Washed gravel, imported duty paid eastern tidewater, per ton	16.75 to 17.50

Kohl president, 138 Madison street, is considering plans for a 1-story plant.

MANSFIELD, O.—Barnes Mfg. Co., T. R. Barnes president, has had plans made by George S. Rider, 610 Century building, Cleveland, for a warehouse and foundry addition, 60 x 200 feet, ramps, no elevators, for the warehouse; 100 x 100 feet for foundry. General contract to Boldt Construction Co., 1969 East Seventieth street, Cleveland.

SPRINGFIELD, O.—Daniel Plow Co., recently organized by E. H. Daniel and others, will establish a plant to manufacture a motor plow recently developed.

TOLEDO, O.—Southern Wheel Co., Atlanta, Ga., has let contract to A. Bentley & Sons, 201 Belmont avenue, for four buildings on Westwood avenue, Toledo.

ERIE, PA.—Metric Metal Co. Tenth street and Hess avenue, will build a brass foundry across street from its plant, with subway connecting.

ERIE, PA.—Erie Lighting Co., subsidiary of the Penn Public System, will build an addition to its power plant at the foot of Holland street, 77 x 95 feet.

HUBBARD, PA.—Valley Mould & Iron Co., Sharpsville, Pa., will build a mold plant here.

NEW CASTLE, PA.—National Radiator Co., Robert S. Waters secretary, Central avenue, Johnstown, Pa., will build a foundry plant, general contract to H. K. Ferguson Co., 3900 Euclid avenue, Cleveland.

PHILADELPHIA—Bids on a general contract for two substations for the department of city transit have been opened recently.

PHILADELPHIA—Edward G. Budd Mfg. Co., has just closed on reinforcing bars for a plant addition.

PHILADELPHIA—Connery & Co. Inc., Second and Luzerne streets, is building an addition to its boiler and plate works.

PHILADELPHIA—S. L. Allen & Co., Glenwood avenue and Fifth street, agricultural implement manufacturer, will build an addition to increase its output.

PHILADELPHIA—Philadelphia Electric Co., Chestnut and Tenth streets, has had plans made for a steam-operated electric power unit for which financing is being arranged.

PHILADELPHIA—Contract for a $3000 machine shop for L. J. Kolb, 1415 Melon street, has been awarded to George F. Dougherty, 2041 Moravian street.

PHILADELPHIA—The Gulf Refining Co., 1515 Locust street, will start work at once on a $10,000 repair shop on Penrose Ferry road.

PHILADELPHIA—The Philadelphia Electric Co. will start work at once on a $600,000 steam plant, Ninth street and Willow. John T. Windrim is architect in charge.

PHILADELPHIA—Plans have been completed for a plant addition for S. L. Allen & Co., Fifth street and Glenwood avenue. The Ballinger Co. is architect in charge.

PHILADELPHIA—Wm. Steel & Sons Co., 219 North Broad street, has been awarded the general contract for a $60,000 sales and service station for the Thornton Fuller Co., Greene and Rittenhouse streets.

ROCHESTER, PA.—Guarantee Liquid Measure Co., M. R. Ambrose secretary, Rochester, will build a manufacturing and boiler plant and office building. General contract to Rust Engineering Co., 311 Ross street, Pittsburgh.

WILKES-BARRE, PA.—Susquehanna Collieries Co., Glen Lyon, Pa., will rebuild its blacksmith and car repair shops recently burned.

CRANSTON, R. I.—Grinnell Co. Inc., 260 West Exchange street, will build a 2-story valve manufacturing plant here.

PAWTUCKET, R. I.—J. D. Crosby Co., Prairie avenue, has let contract to the Central Engineering & Construction Co., 210 Main street, for a 1-story machine shop 86 x 126 feet.

BEAUMONT, TEX.—Boykin Machinery & Supply Co., Laurel and Second streets, Burwell Boykin president, has bought adjoining property and will build 1-story addition 75 x 200 feet, early in 1927.

DALLAS, TEX.—Browning-Ferris Machinery Co., has been incorporated with $150,000 capital by Royal Ferris Jr., 3931 Prescott street.

DALLAS, TEX.—Cen-Tennial Cotton Gin Co., Tenth avenue, Columbus, Ga., is building branch plant on 7-acre site in Eagle Ford industrial district to serve Dallas district.

DALLAS, TEX.—Browning-Ferris Machinery Co. has been incorporated with $150,000 capital by W. A. Browning, Royal Ferris Jr. and E. A. McKinney.

HOUSTON, TEX.—Hughes Tool Co., Howard Hughes Jr., president, 300 Hughes street, is preparing to build additions to its mill and warehouse.

HOUSTON, TEX.—Engineering Service Co., Post-Dispatch building, has been given contract for 6-story stee and concrete warehouse for Houston Terminal Warehouse & Cold Storage Co.

RICHMOND, VA.—Virginia Electric & Power Co. will build an addition to its steam-operated electric power plant at Norfolk, Va.

ABERDEEN, WASH.—Jones Best Pump Co., Seattle, is having plans drawn for a plant and offices in Aberdeen. The company manufactures rotary pumps.

SEATTLE—Pacific Coast Coal Co., William Aitken, Lyon building, architect, is having plans made for a coal handling plant at Black Diamond, Wash.

BELOIT, WIS.—Work is now under way on a brick and steel garage and repairshop, 81 x 116 feet, for W. E. Karlem, 149 Liberty avenue, Beloit. The cost is estimated at $60,000 or more.

GRAFTON, WIS.—Architects M. Tullgren & Sons Inc., 9 Waverly place, Milwaukee, will take bids after Jan. 1 for the construction of a new high school with vocational departments, in this city. Harry Sohms is secretary of the school board.

KENOSHA, WIS.—Contracts have been awarded by Ole Arneson, 274 North Edwards street, for a public garage, sales and maintenance building, 84 x 153 feet, part 2-story and basement, costing about $45,000. Architect Kenneth White, Kenosha, is in charge.

MILWAUKEE—The Koehring Corp., manufacturer of concrete mixers, paving outfits, etc., has let the general contract to H. Schmitt & Son Inc., 14 Burleigh street, Milwaukee, for erecting a manufacturing addition, 60 x 75 feet, to be used mainly for finishing.

MILWAUKEE—Geo. W. Browne Inc., 144 Broadway, distributor of Chrysler automobiles, has broken ground for a new headquarters building, 3-story, 100 x 120 feet, at 3820-3824 Grand avenue. It will cost about $95,000. Architect Paul Marzillier, 144 Oneida street, Milwaukee, prepared the plans.

Business in Canada

VANCOUVER, B. C.—British Columbia Sugar Refinery Co. will build $15,000 addition to sugar refinery on Powell street. General contractor is the Dominion Construction Co., 509 Richards street.

VICTORIA, B. C.—Sidney Rubber Roofing & Paper Co. has started work on addition to plant here to cost $100,000.

WHITE SULPHUR, B. C.—Superior Spruce Co., Ltd. is having plans prepared for a sawmill here to cost $20,000.

AYLMER, ONT.—Hydro Electric Commission proposes to build a power plant here.

HAMILTON, ONT.—C. R. Brown of the Canadian Drawn Steel Co. announces that his company will start work at once on an addition to its plant here to cost $10,000.

HAMILTON, ONT.—N. Slater & Co., Sydney street, manufacturer of hardware specialties, etc., will build addition to plant here at a cost of $20,000. General contractors, Mitchell & Riddell, 46 Head street.

HAMILTON, ONT.—Hamilton Service & Supply Ltd. has been incorporated to manufacture and deal in automobiles, radios and aeroplanes with $40,000 capital stock by Richard J. Wilmot; William H. White and Stanley H. Slater.

HAMILTON, ONT.—Dominion Power & Transmission Co. is having plans prepared and proposes to start work immediately on a new substation in the west end of the city, which will be rushed so as to be ready for operation by next spring. The building will be a combination railway and power substation and with electrical equipment will represent an expenditure of $100,000.

TORONTO, ONT.—W. S. Giles Ltd. has been incorporated to manufacture and deal in tractors, automobiles and motor vehicles with $40,000 caupital stock by Robert R. McKay, Andrew C. Ross, Frank M. McKay and others.

TORONTO, ONT.—Raymore Mfg. Co. Ltd. has been incorporated to carry on the business of brass and iron founders and engineers with $200,000 capital stock by Isaac Johnson, Leonard J. Johnson, Leslie J. Wright and others.

TORONTO, ONT.—Ossian Gold Mines Ltd. has been incorporated to mine, smelt and refine ores, metals, and minerals with $4,000,000 capital stock by William R. Wadsworth, Wilfred H. Hefferman, Harry M. Tarras and others.

TORONTO, ONT.—Parker Fountain Pen Co., Janesville, Wis., local representative, V. A. Smith, 350 Sarauren avenue, Toronto, proposes to build a manufacturing plant in this province at a cost of $200,000. Location not yet decided.

TORONTO, ONT.—Hertz Drivurself Station Canada Ltd. has been incorporated to manufacture and deal in trucks, motors and air ships with capital stock of $200,000 and 8000 shares no par value, by George M. Clark, George C. Ames, Earnest Hathaway and others.

TORONTO, ONT.—Empire Radio Distributors Ltd. has been incorporated to manufacture and deal in radios, motors, engines and machines with $40,000 capital stock by Robert F. Millar, Edward M. Cockin, Alfred B. Armstrong and others.

TORONTO, ONT.—Canadian National Railways has placed an order for some 20 tools for new shops under construction here, and still other tools and equipment have to be purchased, including one plain radial drill and one 300-ton hydraulic axle straightening machine.

TORONTO, ONT.—Plans are being prepared by Chapman & Oxley, Northern Ontario building, for the first unit of a factory at Fleet street and Boulevard drive, Toronto, to cost $250,000 in connection with $1,000,000 plant here for Crosse & Blackwell, Canada, Ltd., 43 Front street East, Toronto.

TORONTO, ONT.—Contracts have been awarded by the city in connection with the north Toronto sewer system as follows: Nelson River Construction Co. for concrete construction, $428,917; W. Sell Construction Co. brick and concrete construction, $428,917; and W. R. Worthington Construction Co. brick construction, $218,000.

CAP ROUGE, QUE.—Preliminary work has been started on pulp and paper mills here to cost $1,000,000 for the St. Regis Paper Co., 30 East Forty-second street, New York. Bids will be called next spring for the general contract for the mills by A. P. McKinnon, Trust building, Place d'Armes, Montreal, Que., local representative.

DESCHENES-SOUTH HULL, QUE.—International Paper Co., Sussex street, Ottawa, Ont., and 100 East Forty-second street, New York, contemplates building paper mills here to cost approximately $4,000,000.

GRAND ANSE, QUE.—M. McCormick is preparing plans for a power plant here to cost $60,000.

MONTREAL, QUE.—Standard Paper Box Co., 6240 Park avenue, will build factory addition to cost $20,000.

PORT ALFRED, ONT.—Port Alfred Pulp & Paper Co., has awarded the general contract to the Foundation Co. of Canada, Ltd., 746 Sherbourne street, Montreal, Que., for a complete drum barker and wood handling plant here to cost $500,000. The contract to supply six 12 x 45-foot wood-barking drums of new design, each of which will weigh 220,000 pounds has been awarded to the William Hamilton, Ltd., Peterborough, Ont.

ROUYN, QUE.—The Steel Company of Canada Ltd. has a force of men at work on the construction of a large smelter and other buildings of the Noranda mines.

THREE RIVERS, QUE.—North Shore Power Co. has started work on addition to plant on St. Maurice street to cost $25,000.

THREE RIVERS, QUE.—Canada Iron Foundries, Ltd., St. Maurice street, proposes to build addition to plant here to cost $1,000,000. Plans are being prepared by owner's staff.

Refractories

FIRE CLAY BRICK

Per 1000 f.o.b. works

Pennsylvania, No. 1	$40.00 to 43.00
Pennsylvania, No. 2	35.00 to 38.00
Ohio, No. 1	40.00 to 43.00
Ohio, No. 2	35.00 to 40.00
Illinois, No. 1	40.00 to 43.00
Illinois, No. 2	35.00 to 38.00
Kentucky, No. 1	40.00 to 43.00
Kentucky, No. 2	38.00 to 40.00
Missouri, No. 1	40.00 to 43.00
Missouri, No. 2	35.00 to 38.00
Maryland, No. 1	40.00 to 45.00
Maryland, No. 2	36.00 to 40.00
Georgia and Ala. No. 1	40.00 to 45.00
Georgia and Ala. No. 2	30.00 to 35.00

SILICA BRICK

Pennsylvania	43.00
Chicago	52.00
Birmingham	52.00

MAGNESITE BRICK

Per Net Ton Seaboard Base

9 x 4½ x 2½	65.00

CHROME BRICK

(Per Net Ton)

9 x 4½ x 2½	45.00

New Trade Publications

ELECTRIC MOTORS—Century Electric Co., St. Louis, has issued a bulletin featuring its motors for use with oil burners, house pumps and mechanical refrigerating systems.

TWIST DRILLS—New Process Twist Drill Co., Taunton, Mass., has issued a catalog of its products, with illustrations of the various forms of drills and complete specifications.

REFRACTORIES—Quigley Furnace Specialties Co. Inc., New York, has issued a bulletin covering its refractory material for use in laying fire brick to obtain tight and lasting joints and in repairing fire walls after erosion by heat. Illustrations show results of its use.

NICKEL STEEL—International Nickel Co., New York, has issued a bulletin of 16 pages on physical properties of nickel and nickel chromium steels, compiled by its development and research department. Curves show the average values of tensile strength, elastic limit, reduction of area, elongation and brinell hardness at various drawings for standard Society of Automotive Engineers nickel and nickel chromium steels. Tables give the maximum and minimum values of the same properties by various authorities.

FOUNDRY EQUIPMENT—Several bulletins have been issued by the Whiting Corp., Harvey, Ill., covering its tumbling mills, dust filter and balanced cupola charger. Each is illustrated with halftones of the devices and text to make clear their construction, operation and accomplishments.

BOXES AND PLATFORMS—Truscon Steel Co., Youngstown, O., has issued a booklet describing its alloy steel boxes and platforms for various industrial uses, illustrated by many types of these products and actual installations. Foundry flasks of the same materials are given a place.

HYDRAULIC PRESSES—Hydraulic Press Mfg. Co., Mt. Gilead, O., has issued the first number of a quarterly publication it intends to put out quarterly for the benefit of those interested in this class of equipment. It is devoted to details of the manufacture and application of hydraulic presses and a series on the hydraulic transmission of power will be started in an early issue.

MOTOR CONTROL—A control system for direct-current motors is described and illustrated in a current bulletin of the General Electric Co., Schenectady, N. Y. This is a type of controller first developed for use in connection with motors driving rolling mills, its use has been expanded to include many other applications. Full details of the controller and its parts are presented in illustration and text.

TEMPERATURE CONTROL—Leeds & Northrup Co., Philadelphia, has issued a bulletin covering its devices for controlling temperature of blast furnaces. The control of the hot blast is achieved by an automatic means and record of temperature in downcomer and the several stoves aids in keeping the hot blast close to the point desired. Charts are reproduced to show the uniformity attained by the automatic control.

Discounts and Extras

Steel Pipe

Pittsburgh and Lorain basing discounts, jobber's carloads.

Evanston, Ill., and Indiana Harbor, Ind., take differential 2 points less discount.

Chicago takes differential 2½ points less than Pittsburgh-Lorain basis.

Butt Weld

	Black	Galvanized
⅛-inch	45	19½
¼ and ⅜-inch	51	25½
½-inch	56	42½
¾-inch	60	48½
1 to 3-inch	62	50½

Lap Weld

2-inch	55	43½
2½ to 6-inch	59	47½
7 to 8-inch	56	43½
9 and 10-inch	54	41½
11 and 12-inch	53	40½

REAMED AND DRIFTED

Butt Weld

1 to 3-inch	60	48½

Lap Weld

2-inch	53	41½
2½ to 6-inch	57	45½

EXTRA STRONG—PLAIN ENDS

Butt Weld

⅛-inch	41	24½
¼ and ⅜-inch	47	30½
½-inch	53	42½
¾-inch	58	47½
1 to 1½-inch	60	49½
2 to 3-inch	61	50½

Lap Weld

2-inch	53	42½
2½ to 4-inch	57	46½
4½ to 6-inch	56	45½
7 to 8-inch	52	39½
9 and 10-inch	45	32½
11 and 12-inch	44	31½

DOUBLE EXTRA STRONG

Butt Weld

½-inch	42	32½
¾ to 1½-inch	45	35½
2 to 2½-inch	47	37½

Lap Weld

2-inch	41	32½
2½ to 4-inch	43	34½
4½ to 6-inch	42	33½
7 to 8-inch	38	25½

(Note—Large jobbers obtain additional preferential discounts of 1 and 5 on black and 1½ and 5 on galvanized.)

Wrought Iron Pipe

Pittsburgh basing discounts, jobbers' carloads. Individual quotations made on delivered basis.

THREADS AND COUPLINGS

Butt Weld

¼ and ⅜-inch	+11	+39
½-inch	22	2
¾-inch	28	11
1 to 1½-inch	30	13

Lap Weld

1¼ and 1½-inch	Upon application	
2-inch	23	7
2½ to 6-inch	28	11
8 to 6-inch	28	13
7 to 12-inch	26	11

PLUGGED AND REAMED

Two points less than above

EXTRA STRONG, PLAIN ENDS

¼ and ⅜-inch	+19	+54
½-inch	21	7
¾-inch	28	12
1 to 1½-inch	30	14

Lap Weld

2-inch	23	9
2½ to 4-inch	29	15
4½ to 6-inch	28	14
7 to 8-inch	21	7
9 to 12-inch	16	2

DOUBLE EXTRA STRONG

Butt Weld

½-inch	+47½	+59½
¾-inch	+28	+40
1-inch	+34	+46
1¼-inch	+28	+40
1½-inch	+27	+39

Lap Weld

2 and 2½ inches	+13	+25
3 to 4-inch	+ 8	+17
4½ to 6-inch	+ 9	+18
8-inch	+12	

(Note—Large jobbers obtain additional preferential discounts of 1, 5 and 2½ on black and galvanized.)

Boiler Tubes

Pittsburgh less carload discounts. Carload 4 points larger

STEEL (Lap Welded)

2 and 2¼-inch	23 off
2½ and 2¾-inch	33 off
3-inch	36 off
4¼ to 3¾-inch	38½ off
4 to 13-inch	42 off

(Note—Additional discounts of 5 to 7 extra 5 per cents now being given.)

CHARCOAL IRON

1½-inch	+22
1¾-inch	+12
2 and 2¼-inch	+ 2
2½ to 3-inch	3
3¾ to 4½-inch	5

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS COLD DRAWN

1-inch	56 off
1¼ and 1½-inch	48 off
1¾-inch	32 off
2 and 2¼-inch	27 off
2½ and 2¾-inch	35 off
3-inch	41 off
3¼ and 3½-inch	43 off
4-inch	46 off
4½, 5 and 6-inch	41 off

SEAMLESS HOT ROLLED

2 and 2¼-inch	30 off
2½ and 2¾-inch	38 off
3-inch	44 off
3¼ and 3½-inch	46 off
4-inch	49 off
4½, 5 and 6-inch	44 off

(Note—Additional discounts of 2 or 3 extra 5 per cents now being given.)

SEAMLESS STEEL MERCHANT BOILER TUBES

Extras:

Add $8 per ton for more than four gages heavier than standard and add 10 per cent to theoretical weight.

Add 5 per cent for lengths over 24 feet and not over 26 feet.

Smaller tubes than 1-inch and lighter than standard gage to be sold at mechanical tubing list and discount.

Intermediate sizes and gages not listed above take price of next larger outside diameter and heavier gage.

SEAMLESS STEEL MECHANICAL TUBING

Base Discounts on New List July 1, 1925

Carbon 0.10 to 0.20 per cent.....50 to 55 off

Carbon 0.30 to 0.40 per cent.....45 to 50 off

SEAMLESS STEEL LOCOMOTIVE AND SUPERHEATER TUBES

Outside diameter	Net prices per foot f.o.b. Pittsburgh Gage	Price
2-inch	12-gage	14¼c
2-inch	11-gage	15c
2-inch	10-gage	16c
2¼-inch	12-gage	16c
2¼-inch	11-gage	17c
2¼-inch	10-gage	18c
3-inch	7-gage	33c
5⅝-inch	9-gage	50c
5½-inch	9-gage	52c

Plus usual extras for forming and for long lengths over 18 feet and for commercially exact lengths.

Plate Extras

BASE

Rectangular plates, tank steel or conforming to manufacturers' Standard Specifications for structural steel, dated Nov. 24, 1922, or equivalent, ¼-inch thick and over on thinnest edge, (except for ¼-inch or 72 inches wide when ordered to weight in pounds per square foot—see width and gage extras), 100 inches wide and under, down to but not including 6 inches wide, 5 feet 0 inches long up to published limit in length but not over 80 feet 0 inch, are base. Extras per pound for width or diameter.

All Plates, Rectangular or Otherwise

¼-inch thick and heavier, but not less than 11 pounds per square foot, if ordered to weigh—

Over 100 inches to and including 110 inches	.05c
Over 110 inches to and including 115 inches	.10c
Over 115 inches to and including 120 inches	.15c
Over 120 inches to and including 125 inches	.25c
Over 125 inches to and including 128 inches	.50c

Plates less than ¼-inch or lighter than 11 pounds per square foot.

Over 72 inches to and including 84 inches	.10c
Over 84 inches to and including 96 inches	.20c
Over 96 inches to and including 100 inches	.30c

Over 100 inches add .35c to width extras for plates ¼-inch thick and heavier.

GAGE

Plates not Exceeding 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{16}$-inch; or lighter than 10.2 pounds per square foot to and including 7.65 pounds per square foot..... .20c

Plates over 72 Inches Wide

Plates less than ¼-inch gage, to and including $\frac{7}{16}$-inch; or lighter than 11 pounds per square foot, to but not including 7.65 pounds per square foot ..... .20c

Plates ordered 7.65 pounds per square foot ..... .30c

QUALITIES

Pressing steel	.10c
Flange steel (boiler grade)	.15c
Ordinary firebox steel	20c
Stillbottom steel	.30c
Locomotive firebox steel	.50c
Marine steel	1.50c
Hull material subject to U. S. Navy Dept. Specifications for Medium or Soft Steel	.10c
High tensile hull steel subject to U. S. Navy Dept. or equivalent specifications	1.00c
Boiler steel subject to U. S. Navy Dept. Specifications, classes A and B	1.50c
Hull plates to hull specifications, required to stand cold flanging, take extra for flange steel.	

Floor Plates

Checkered plates 1.75c

Checkered plates are not furnished to sketch and are rolled from "Stock Steel" only. No physical tests will be made on checkered plates.

INSPECTION

Mill inspection .....No extra

Charges for other inspection, such as Lloyd's or American bureau of shipping, will be made by inspection bureau direct to buyer.

CUTTING

LENGTH OR DIAMETER

All Plates, Rectangular or Otherwise

Five feet and over up to published limit of length, but not over 80 feet....No extras

Under 5 feet to 3 feet inclusive	.10c
Under 3 feet to 2 feet inclusive	.25c
Under 2 feet to 1 foot inclusive	.50c
Under 1 foot	1.55c
Over 80 feet to 100 feet inclusive	.10c

Over 100 feet add .25c plus .05c for every additional 2 feet or fraction thereof.

Regular Sketches

With not more than four straight cuts. (Including straight taper plates)

Additional extra ..... .10c

Irregular Sketches

With not more than four straight cuts. (Sketches cannot be sheared wiht re-entrant angles)

Additional extra ..... .20c

Sivyer Castings Can Be Forged and Welded

SIVYER CASTINGS DEPENDABLE

A swing hanger for spring plank on railway passenger car trucks — cast in Sivyer Electric Steel.

Why Sivyer is Replacing Parts Made in Other Metals and by Other Methods.

Sivyer has a complete range of steels and alloy steels that stand up under the hardest service. Sivyer Steels can be forged and welded — and many customers temper them after machining, to provide even greater strength.

Sivyer Castings are cast closely to blue print specifications. Holes are cored. As a result machining and grinding operations are reduced to a minimum. Many Sivyer Castings are assembled without machining.

Sivyer Foundry Practice assures castings of exceptional interior soundness —with the sand-free surfaces that make it easy and cheap for machining tools to work.

For those reasons manufacturers are turning to Sivyer. If you have any parts that are not giving the service that you think they should—that involve high machining or assembling costs — that break too readily in strenuous service—send blue prints of them. Recommendations will be made without obligating you in any way.

Replacing a 3-Piece Forging

for Longer Service—Greater Safety—Lower Costs

The safety of hundreds of railroad passengers depends to a great extent upon this Sivyer Casting. Eight of them carry the entire weight of the car as swing hangers for the spring planks. The original assembly required eight hangers, consisting of three forgings each—twenty-four pieces in all—and wear was a constant factor. Frequent replacements were necessary to reduce the danger of failure in service. On the one-piece Sivyer Hanger wearing points have been reduced by one-half, and these are localized where wear can do the least harm. Replacements are greatly reduced—and the tough strength of Sivyer Electric Steel assures safety. In addition, holes are cored. Expensive drilling and machining is reduced to a minimum. Attempts to make one-piece forging for this job, resulted in failures. Sivyer has been able to handle it successfully.

SIVYER STEEL

SIVYER STEEL CASTING COMPANY, MILWAUKEE

"Where-To-Buy"

A classified-by-products list of advertisers for the convenience of readers. If you don't find what you want, write us and we will tell you where to get it. ¶ Index to advertisements will give you page number of any advertisers and by referring to advertisement you can get full particulars about products.

ACCUMULATORS
Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa.
Lagemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Wood, R. D., & Co., 400 Chestnut St., Philadelphia, Pa.

ACETYLENE (Dissolved)
International Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACETYLENE GENERATORS
Oxweld Acetylene Co., 30 E. 42nd St., New York City.

ACETYLENE IN CYLINDERS
Internaitonal Oxygen Co., Newark, N. J.
Prest-O-Lite Co., The, 30 E. 42nd St., New York City.

ACIDS (Pickling)
American Chemical Paint Co., Ambler, Pa.

ADAMITE ROLLS
American Adamite Co., The, 12th & Etna Sts., Pittsburgh, Pa.

AIR COMPRESSORS—See COMPRESSORS (Air)

ALLOYS
Electro Metallurgical Sales Corp., 30 E. 42nd St., New York City.
Lavino, E. J., & Co., Bullitt Bldg., Philadelphia, Pa.
Metal & Thermit Corp., 120 Broadway, New York City.
Titanium Alloy Mfg. Co., Niagara Falls, N. Y.
Vanadium Corp. of America, 120 Broadway, New York City.

ALUMINUM
Leavitt, C. W., & Co., 30 Church St., New York City.
Rogers, Brown & Crocker Bros., Inc., 21 E. 40th St., New York City.

ALUMINUM (Vanadium)
Vanadium Corp., of America, 120 Broadway, New York City.

ALUMINUM TUBING
Summerill Tubing Co., Bridgeport, Pa.

ANGLES, TEES, CHANNELS—See STEEL (Structural)

ANNEALING BOXES
Adamson Machine Co., The, Akron, Ohio.
Farrell-Cheek Steel Foundry Co., Sandusky, O.
Pittsburgh Malleable Iron Co., 34th & Smallman Sts., Pittsburgh, Pa.
Riter-Conley Co., Oliver Bldg., Pittsburgh, Pa.
Smith, George H., Steel Casting Co., Milwaukee, Wis.
Union Steel Casting Co., 62nd and Butler Sts., Pittsburgh, Pa.
United Engineering & Foundry Co., Farmers Bank Bldg., Pittsburgh, Pa.
Zanesville Malleable Co., Zanesville, O.

ANTIGLARE PREPARATION
Skybryte Co., The, Keith Bldg., Cleveland, O.

APPRAISALS
McKee, Arthur G., & Co., 2422 Euclid Ave., Cleveland, O.

AXLES
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Champion Machine & Forging Co., The, 3675 E. 78th St., Cleveland, O.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
National Tube Co., Frick Bldg., Pittsburgh, Pa.
Transue & Williams Steel Forging Corp., Alliance, O.

BABBITT METAL
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.

BALING PRESSES
Cox & Sons Co., The, Bridgeport, N. J.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.

BAND SAWS (Metal Cutting)
Huther Bros. Saw Mfg. Co., 1190 University Ave., Rochester, N. Y.

BANDS AND HOOPS (Galvanized Strips)
Sharon Steel Hoop Co., Sharon, Pa.

BANDS (Iron)
Bethlehem Steel Co., Bethlehem, Pa.

BANDS (Welded Iron and Steel)
Akron-Selle Co., Akron, O.

BAR BENDERS
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

BARGES (Steel)
American Bridge Co., 71 Broadway, New York City.

BARRELS (Steel)
Cleveland Wire Spring Co., The, 1281 E. 38th St., Cleveland, O.

BARS (Alloy)
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Wheelock, Lovejoy & Co., Inc., 128 Sidney St., Cambridge, Mass.

BARS (Concrete Reinforcements)
Bethlehem Steel Co., Bethlehem, Pa.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Gulf States Steel Co., Brown-Marx Bldg., Birmingham, Ala.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Truscon Steel Co., Youngstown, O.

BARS (Iron and Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Lockhart Iron & Steel Co., Pittsburgh, Pa.
Morris, Wheeler & Co., 30th and Locust Sts., Philadelphia, Pa.
Penn Iron & Steel Co., Creighton, Pa.
Republic Iron & Steel Co., Youngstown, O.
Truscon Steel Co., Youngstown, O.

BARS (Steel)
Bethlehem Steel Co., Bethlehem, Pa.
Bliss & Laughlin, Inc., Harvey, Ill.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Central Alloy Steel Corp., Massillon, O.
Donner Steel Co., Inc., P. O. Box 1000, Buffalo, N. Y.
Franklin Steel Works, Franklin, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Illinois Steel Warehouse Co., 1319 Wabansia Ave., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Pacific Coast Steel Co., Rialto Bldg., San Francisco, Calif.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., 1351 Brown-Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

BARS, STEEL (Electric Furnace)
Timken Roller Bearing Co., The, Canton, O.

BEAMS, CHANNELS, ANGLES, ETC.
Bethlehem Steel Co., Bethlehem, Pa.
Blystone Mfg. Co., Ironton St. Cambridge Springs, Pa.
Carnegie Steel Co., 431 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Phoenix Iron Co., The, 20 So. 15th St., Philadelphia, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

BEARINGS (Ball)
Hoover Steel Ball Co., Ann Arbor, Mich.
New Departure Mfg. Co., The, Bristol, Conn.
Norma-Hoffmann Bearings Corp., Stamford, Conn.

BEARINGS (Journal)
Hyatt Roller Bearing Co., Newark, N. J.
Keystone Bronze Co., 39th St., Pittsburgh, Pa.

BEARINGS (Motor)
Hoover Steel Ball Co., Ann Arbor, Mich.
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffman Bearings Corp., Stamford, Conn.

BEARINGS (Roller)
Hoover Steel Ball Co., Ann Arbor, Mich.
Hyatt Roller Bearing Co., Newark, N. J.
Norma-Hoffman Bearings Corp., Stamford, Conn.
Timken Roller Bearings Co., The, Canton, O.

BEARINGS (Thrust)
Hoover Steel Ball Co., Ann Arbor, Mich.
Norma-Hoffman Bearings Corp., Stamford, Conn.
Timken Roller Bearing Co., The, Canton, O.

BELT LACING (Leather)
Chicago Rawhide Mfg. Co., 1306 Elston Ave., Chicago, Ill.

BELTING (Chain)
Link-Belt Co., 910 S. Michigan Ave., Chicago, Ill.

BELTING (Leather)
Chicago Rawhide Mfg. Co., 1306 Elston Ave., Chicago, Ill.

BENCHES AND FRAMES (Drawing)
Morgan Construction Co., Worcester, Mass.
Vaughn Machinery Co., The, Cuyahoga Falls, O.

BENDING AND STRAIGHTENING MACHINES
Cleveland Punch & Shear Works Co., 3917 St. Clair Ave., Cleveland, O.
Hinman, D. A., & Co., Sandwich, Ill.
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Logemann Brothers Co., 3126 Burleigh St., Milwaukee, Wis.
Long & Allstatter Co., Hamilton, O.
Sutton-Abramsen Engineering Co., Park Bldg., Pittsburgh, Pa.

BENZOL AND TOLUOL RECOVERY PLANTS
Koppers Co., The, Union Trust Bldg., Pittsburgh, Pa.

BILLETS (Forging)
Bethlehem Steel Co., Bethlehem, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.

BILLETS (Forging, Alloy Steel)
Bethlehem Steel Co., Bethlehem, Pa.

BILLETS (Tool Steel)
Union Electric Steel Corp., Frick Bldg., Pittsburgh, Pa.

BILLETS AND BLOOMS
American Rolling Mill Co., Middletown, O.
American Tube & Stamping Plant, The, Stanley Works, The, Bridgeport, Conn.
Andrews Steel Co., Newport, Ky.
Bethlehem Steel Co., Bethlehem, Pa.
Central Alloy Steel Corp., Massillon, O.
Columbia Steel Co., The, Standard Life Bldg., Pittsburgh, Pa.
Donner Steel Co., Inc., P. O. Box 1000 Buffalo, N. Y.
Illinois Steel Co., 208 South La Salle St., Chicago, Ill.
Inland Steel Co., First National Bank Bldg., Chicago, Ill.
Interstate Iron & Steel Co., 104 S. Michigan Ave., Chicago, Ill.
Wheeling Steel Corp., Wheeling, W. Va.
Wood, Alan, Iron & Steel Co. Widener Bldg., Philadelphia, Pa

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